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Do the Math

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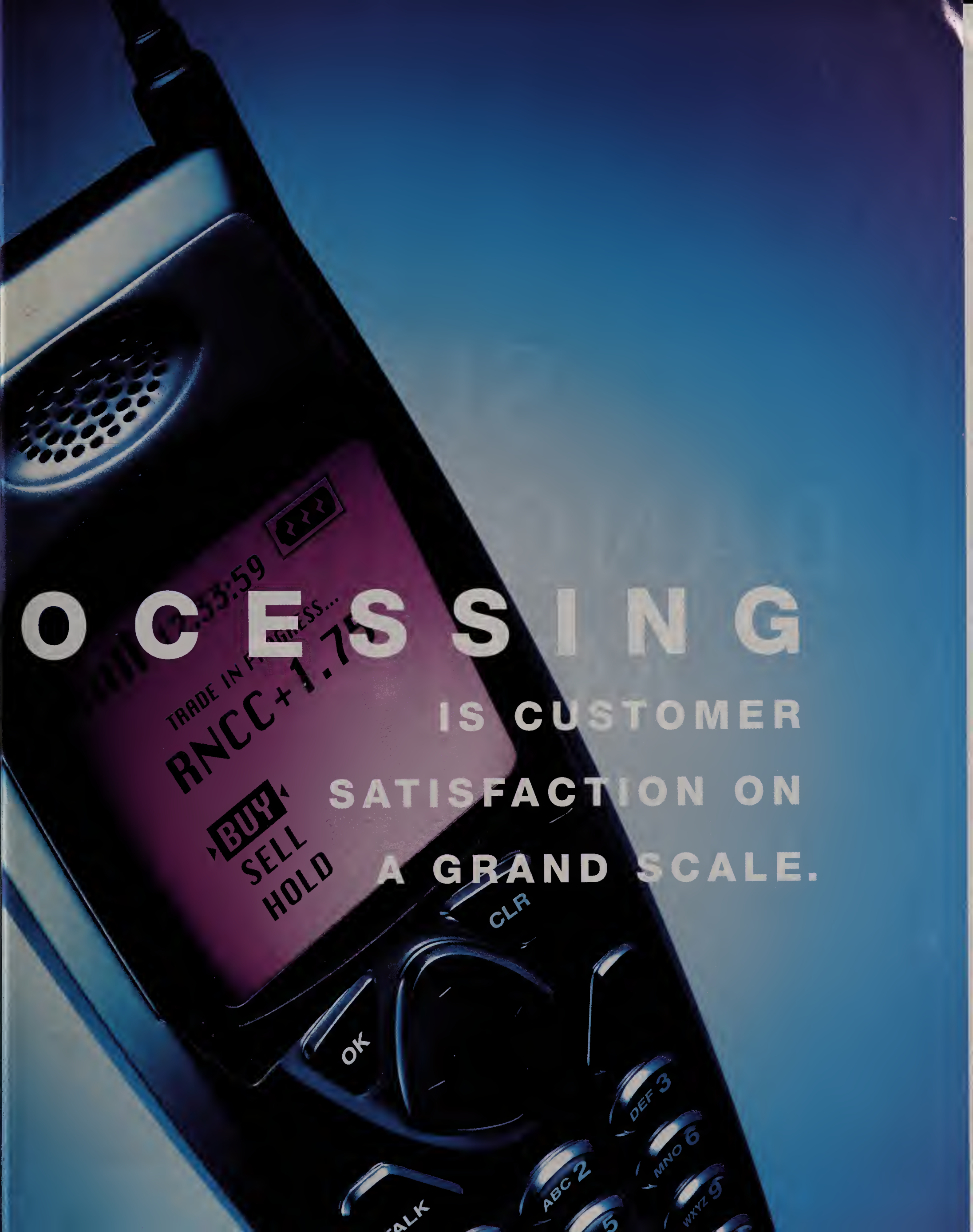
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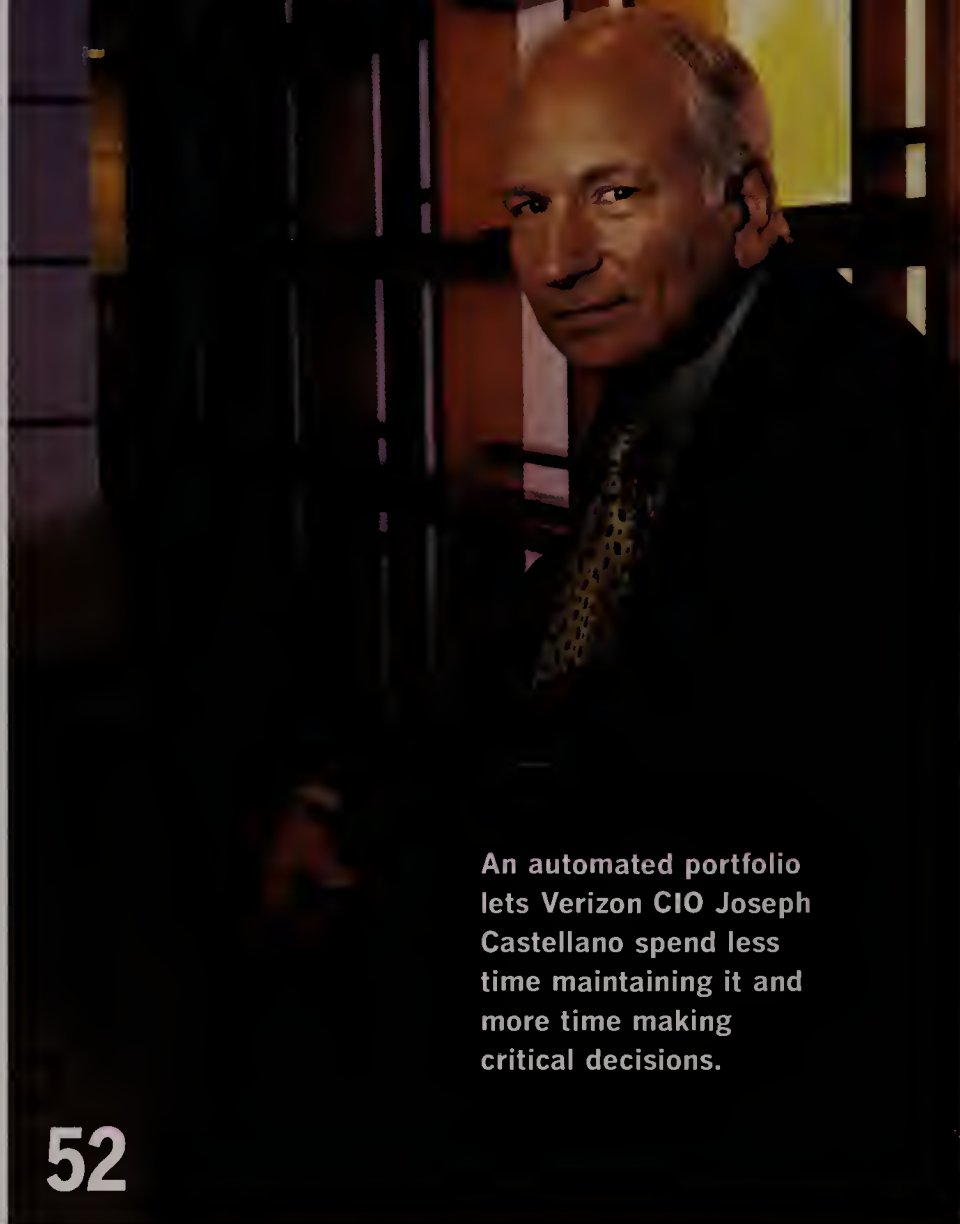
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Do the Math

If you want business credibility, you need to use business tools. Project portfolio management can help align IT, manage value *and* get you a seat at the big table. *By Scott Berinato*

COVER PHOTO BY EDWARD SANTALONE



An automated portfolio lets Verizon CIO Joseph Castellano spend less time maintaining it and more time making critical decisions.

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JD Williams, CEO of Lakota Technologies (right), and Cheyenne River Sioux Tribal Chairman Gregg Bourland want to give hope to their struggling reservation by beating offshore vendors at the outsourcing game. **94**

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Rick Minicucci knew it would take world-class technology to make the financially strapped National Center for Missing and Exploited Children a success. Here's how he got it.

By Lauren Capotosto

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It's a harsh world out there, and CIOs must be able to handle it. Here's how to get the job done. *By Patricia Wallington*

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Earthlink's chief privacy officer had to deal with the FBI and its infamous Carnivore surveillance tool. See how he balances customer privacy concerns and governmental compliance. *By Susannah Patton*

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Playing International Politics

Integrating fragmented IT at Barclays Global Investors would be a lot easier if not for the people. *By Malcolm Wheatley*

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There are great risks in outsourcing software development offshore. Surprisingly, most aren't technical.

Paul Stevens, global head of technology at **Barclays Global Investors**, battles communication gaps that span continents. See how he fills the gaps and his workday.



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New technologies make Web teleconferencing worth another look.

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“Don't be personally hardened by the need for difficult actions. Always keep in mind that people's lives are affected by your decision.”

—Patricia Wallington on making tough decisions 40



How to prepare for the *re-new* economy

Butterflies serve a great purpose in nature.
They are a beautiful and simplistic solution to a complex problem.
A gentle and palatable alternative to the stinging bee.

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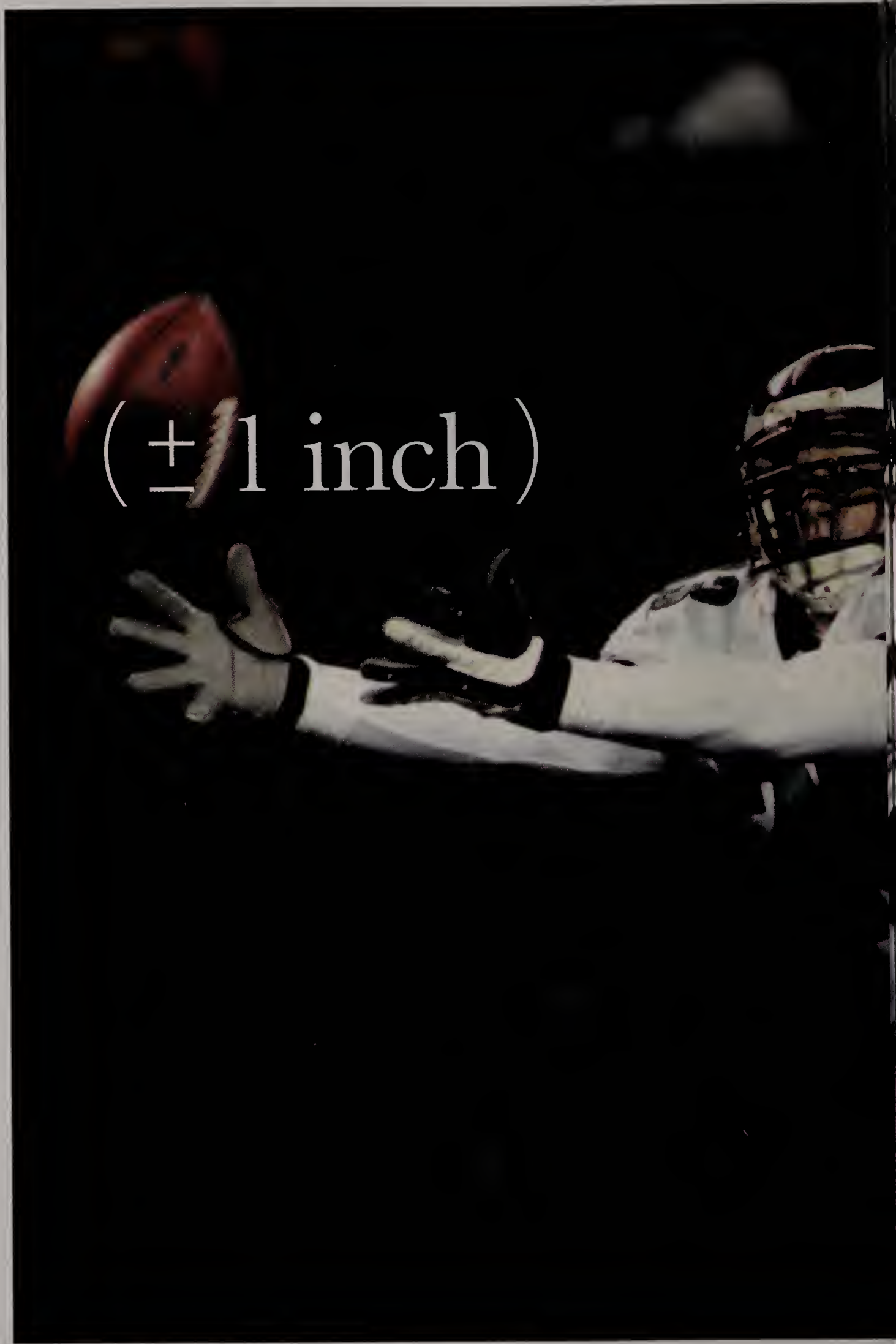
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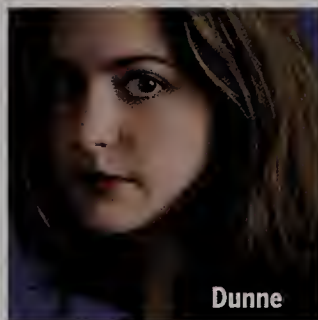


Lindquist

Christopher Lindquist on what's coming and what it's good for. www.cio.com/online/techtact

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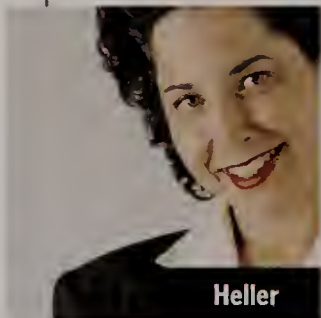
Dunne

WEDNESDAY Metrics

Web Writer Jon Surmacz finds the industry numbers that matter from the country's most reputable analysts. www.cio.com/metrics

THURSDAY Sound Off

For opinion on managerial, political and ethical dilemmas that confront CIOs daily, read Executive Web Editor Martha Heller's column and join the debate. comment.cio.com



Heller

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CIO editors compile the latest articles, metrics, Web references and information on 22 need-to-know subjects. Some of the best-read centers this month include:

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EXECUTIVE RESOURCES

TAMING ERP

Recently, the **CIO Best Practice Exchange**—our private online forum for CIOs—discussed enterprise resource planning. Here are five big ideas posted by battle-scarred ERP veterans.

1 "Avoid big-bang implementations like the plague. Small, focused implementations allow for better project management, lessen overall business risk and provide for a better learning environment."

—JOHN NORDIN, CIO, A.M. CASTLE

2 "When upgrading your ERP system...hire the same firm [that did the fit-gap analysis between versions] to do the actual upgrade project for a fixed price. If they are any good at all, they won't blink an eye when you ask for this."

—STEVEN STEINBRECHER, CIO, CONTRA COSTA COUNTY

3 "I'd strongly suggest that as you look at the real costs of an ERP implementation, you also include the increased compensation for employees using new skills with more complex tools."

—MARC WEST, CIO, ELECTRONIC ARTS

4 "Make it a company project, not an IT project. Treat it like you were building a warehouse, opening a new store or relocating to new corporate headquarters across town. Everyone in the company has a piece of the decision."

—MIKE ANDERSON, CIO, THE BISYS GROUP

5 "There are now many experienced ERP consultants on the market willing to take substantial pay cuts for a stable position with a stable company."

—TERRY MARSHALL, CIO, ADAMS GOLF

If you are the CIO of a large organization and are interested in learning more about membership in the **Best Practice Exchange**, contact Martha Heller, director of the Exchange, at mheller@cio.com.

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EQUATION 1A
 $T = K \sum_{i=1}^N$
 $1/\mu_i R$
PACKET
FOR
 $1/\mu_i C_i T$
REPRESENTS
 (λ_i/μ_i)
THE
THE
15
MS
26

THE PROCEDURE YIELDS THE FOLLOWING EQUATION FOR
CAPACITY

$$1 - \frac{\lambda_i}{\mu_i} + \left(\frac{D_e}{\lambda_i} \right) \frac{\sqrt{\lambda_i d_i}}{\sum_j \sqrt{\lambda_j d_j}} \quad (12)$$

$$L_e - D - \sum_i \frac{\lambda_i d_i}{\mu_i} > 0 \quad (13)$$

IF WE SUBSTITUTE THIS RESULT BACK INTO THE EQ
(12) WE OBTAIN THAT THE PERFORMANCE MEASURE
IS A CHANNEL CAPACITY ASSIGNMENT

$$T = \frac{\pi \left(\sum_i \sqrt{\lambda_i d_i} \right)}{\mu_i}$$

WHERE

$$\pi = \frac{\sum_i \lambda_i}{\gamma} \quad \text{CHANNEL LENGTH (15)}$$

THE RESULT IS REFERRED TO AS THE
SQUARE CAPACITY ASSIGNMENT; THIS
FIRST PROVIDES TO EACH
PARTICULAR CHANNEL A LENGTH EQUAL TO λ_i/μ_i WHICH IS MERELY
THE RATE WHICH MUST PASS OVER THAT
CHANNEL IT MUST OBVIOUSLY BE PROVIDED

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encryption technology and more. Years later, GTE acquired BBN and invested billions of dollars to expand their existing infrastructure into a 17,500-mile, Tier 1, fiber-optic global network.

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services was spun off from GTE last year, and today we're a billion-dollar company known as Genuity.

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In 1969, BBN was hired by the U.S. government to develop the ARPAnet, the forerunner of the Internet.



INTERNETWORKING

In 1997, BBN was acquired by GTE, the company that created our high-speed, 17,500-mile, Tier 1, fiber-optic network.

GENUITY

In 2000, GTE Internetworking became an independent company, renaming itself Genuity. Today, we offer a vast array of managed Internet services, including *Black Rocket*.[™]

GENUITY[™]

From the Editor

lundberg@cio.com



Check out our Special Report on IT value, "What's IT Worth?" from the May 1, 2000, issue at www.cio.com/archive/050100_intro.html.

The Big Squeeze

"Difficult times give rise to the strongest companies in the long run."

—James Fallows, national correspondent,
The Atlantic Monthly

INTERESTING THINGS ARE going on among CIOs and their business partners, and CIOs and their suppliers. Top management is putting the squeeze on IT executives to spend less on new projects, and CIOs are dusting off their value metrics and methodologies—and their persuasion skills—to justify the large sums they want to spend on IT. At the same time, CIOs are fighting for control with business-unit execs who have basically spent as much as they wanted for the past few years. These folks are not happy at having their pet IT projects stacked up against other groups' projects. They definitely do not support more controlled, rational and centralized IT spending. CIOs, meanwhile, are caught in the middle.

There are plenty of tools for measuring value and prioritizing projects—return on investment, economic value added, balanced scorecard, real-options theory. These are good, depending on your goals—but some are complex and costly to roll out.

One tool that's been around the business world for years and that's relatively easy and inexpensive to get going is project portfolio management (PPM). The fundamental idea is to look at, evaluate and prioritize all your IT projects together, man-

aging them as you would any business portfolio. In PPM, you measure projects against their contribution to the business—factoring in their risk and potential payoff—rather than against each other. Then you assign them to certain types of investments and within those categories prioritize based on the size of the investment, risk factors, payoff and such, and make your decisions from there. For Scott Berinato's five easy steps to project portfolio management, see "Do the Math," Page 52.

If CIOs face a lot of internal pressure these days, you can at least vent some of your frustration on your vendors. In this down economy, IT buyers have an upper hand that you'd be foolish not to take advantage of. Why would you even give an audience to a salesperson who didn't want to know about the challenges you're facing and be able to convincingly explain how their particular product is going to help you out? And isn't it time to push back on some of the pricing policies and packages vendors are trying to shove down your throats?

I propose that these are mostly good developments for IT. It's good to avoid spending money that may put your business at undo risk and that won't bring a reasonable return. It's good for vendors to understand your business problems and not just the great capabilities of their own products. It's good, but it's sure not easy. And the companies that can manage their way through it are the ones that will make it in the long run.

Alkis Lundberg

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Reader Feedback

A MORE CAREFUL ANALYSIS

As a CEO, and a former IT analyst and consultant, I think there needs to be a standard set for both the analyst and the company ["How to Analyze the Analysts," July 15, 2001]. I know of several analysts who are working with a customer and with the vendor at the same time and will collect a fee from both at the end of the contract. Ethically this is wrong. An analyst should represent the interests of either one or the other, not both. Also, there are many analysts who do not have the experience or the background knowledge necessary to do the job. In today's world, companies hire younger, less experienced CIOs and IT managers. Look back at your responses from CIO's poll on age discrimination [www.cio.com/printlinks]. It shows that there is a definite trend toward hiring younger, sometimes less experienced and less qualified managers who cannot make a qualified judgment about analysts' credentials. It comes down to the old saying, You get what you pay for.

There is a second side to this issue, though. Customers' expectations and restrictions often limit the evaluation process. I once had a doctor who wanted to hire me to evaluate an MQSA [Mammography Quality Standards Act of 1992] system and informed me that he had already made a selection and I was to verify that it was the right selection. Had I taken the contract, was I ethically responsible to go outside his guidelines to get him a better product? No. Under the limitations he provided, my function would have been to validate his selection. When companies use the services of an analyst or a consultant, they must make sure that the person they use has the qualifications and experience to perform the job. To do that, the company's manager must have the necessary qualifications to evaluate analysts. There is often a lack of qualifications and experience on both sides.

Edward D. Hauver
CEO
E-Len Co.
Riverside, Calif.
ehauver@aol.com

The trouble begins when poorly experienced analysts are hired straight out of college, with no prior relevant work experience in the industry they analyze. It is fatal when these analysts also try to turn into futurists. Then the most a client can expect is some academic rigor from the analyst's reports.

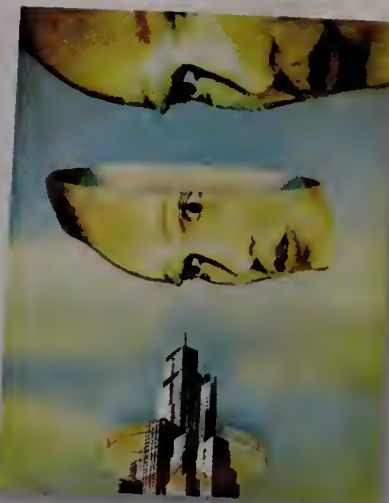
An option for companies might be to consider setting up a small tight-knit strategic initiatives group. People in this team could be handpicked from various functions within the company or from the industry, and be rotated in operational roles at regular intervals. This team could liaise with data providers and meet industry leaders at public forums and then be responsible for trend analysis and strategic direction in the company's chosen markets.

Having worked in such a group in a leading IT services company, I can say that the concept works and delivers results.

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Consultant
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Bourne End, England
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How To Analyze The Analysts

The average CEO spent more than \$500,000 on outside directors last year. The fact is, much of it goes unused. Here are six practical ways to get what you're paying for.

[illegible]

Lauren Gibbons Paul's article was dead-on. Years ago, I worked with Scott McCready and saw his techniques firsthand. It was appalling! Most analysts work with no primary research. This is because primary research is not only expensive, it also provides little flexibility. Imagine yourself in a meeting with the top marketing executives of major corporations such as BEA Systems, Compaq, IBM and Sun Microsystems. You are presenting your latest demand assessment requirements tracking survey (DARTS). The news is not good—it shows that the company is losing mind-share to its competitor. We have been in many of these types of meetings.

Several years ago we presented DARTS to Jimmy Treybig, then president of Tandem, on the future of the NonStop operating system and suggested some alternatives. We were at odds with eight other advisers including Gartner, IDC and Meta Group. Treybig went with the majority and ignored our advice. Two years later he said the others were totally wrong and he wished he had taken our advice. He asked me why was I not more forceful in our stance. A similar event happened with Ellen Hancock in respect to CICS/6000. To this day she claims we are the only ones who told her the truth about her chances with that product.



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Portals: Build Them Right and They Will Come

Fast on their way to becoming the primary way professionals share information, portals are red hot within organizations today. But to paraphrase a popular movie, if you build a portal, will they come? And if users come, will they stay?

The short answer is, "not necessarily." The reason is that firms often don't take a true customer-centric approach to building portals to assure an optimal user experience. Moreover, firms frequently underestimate the complexity of integrating legacy data with other information sources to be fed into the portal.

"When building portals, you need to think in terms of a full life cycle," notes Terry Hisey, V. P. and General Manager, e-Business Services at Unisys. "This starts with alignment between your business strategy and portal strategy and continues through devising the solution to acquiring information to integrating data sources. Then it's on to deployment and ongoing support."

To make this dream a reality for clients, Unisys has combined its rock-solid experience in consulting and integration with patent-pending portal management methodologies. To learn how Unisys can help conceive, build and manage world-class portals, visit: www.aheadforebusiness.com

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InBox

In the 1996 DARTS, at the height of Hewlett-Packard hype, we were predicting in two years that HP would stall and Sun would be dominant. When we presented this at a meeting, a person jumped up and screamed. Within the next two years HP stalled and Sun took off like a rocket. Last year we saw Sun stalling. These are well-known facts today.

A more disturbing trend is happening lately. We have received several proposals from some very big and well-known com-

and purchased from external information suppliers.

External information is a major expense for most companies. Large global banks can spend between \$200 million and \$500 million annually to support trading rooms, information centers, research staff as well as mid- and back-office financial and operational functions.

In many companies this function is poorly managed. Basically, companies do not know what information they purchase,

Information is the middle word in the title CIO and warrants more attention than it currently gets.

panies to buy research services with a clause that says that they have control over the results. In other words, if the research comes out in their favor, it will be released; otherwise it will be buried. In this regard the company will also attempt to narrow the research so that only they qualify, thereby showing up as number one. There are many analyst firms that will take on this type of work.

We never have and never will. When all is said and done, the only thing that counts is your word.

James H. Johnson
Chairman

The Standish Group International
West Yarmouth, Mass.

how much and from whom, and they have not managed the acquisition process. It is not uncommon for a company to purchase the same information multiple times, or to have multiple contracts with the same information supplier.

Information is the middle word in the title CIO and warrants more attention than it currently gets. It should not be just about the technical environment but should also include the information, the content.

Willem Noorlander
President
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New York City
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CORRECTION

In "Twist and Spout" (Aug. 15, 2001), we incorrectly identified the photo subjects on Pages 73 and 74. Bruce Thoman is pictured on Page 73 and Rod Kalberer on Page 74. We regret the error.

WHAT DO YOU THINK?

Send your thoughts and feedback to letters@cio.com. Letters may be edited for length or clarity.

INFORMATION IS KEY

In "Money Matters" [From the Publisher, Aug. 1, 2001], Gary Beach quotes the Meta Group report on IT spending in corporate America. I have seen parts of the report and am familiar with the breakdown of the five areas and the focus on managing expenses.

What confuses me is that companies do not focus on one of the primary components—the information itself. By information, I mean the content managed internally

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Edited by Sandy Kendall

D A T A M A N A G E M E N T

IT for Sore Feet

By Kathleen S. Carr

EIGHTEEN MONTHS AGO, I spent three days walking in the sun and heat, pounding Powerade and water, during a trek that would take me 60 miles. I slept in a tent (in the rain), stood in line to shower (in a truck) and used a needle to extract fluid from blisters the size of golf balls. And I can't wait to do it again.

E - C O M M E R C E

Special Event

CIO IS A SPONSOR of the Global E-Commerce 2001 Conference, which will take place on Oct. 3 at the United Nations in New York City. The conference highlights e-commerce, information security and networking as a means to improve global business and economic conditions. Speakers include U.N. ambassadors and executives from several technology, consulting and publishing companies, including CIO Publisher Gary Beach and Editor in Chief Abbie Lundberg. Attendance is free. For more information, go to www.aitglobal.com.

I was just one of the 3,400 participants in last year's Avon Breast Cancer 3-Day walk in Boston. As part of its Breast Cancer Crusade launched in 1993, New York City-based cosmetics and beauty products seller Avon Products annually hosts three-day walks in nine cities, each attracting about 3,000 participants. That's a lot of people and miles and pledge sheets and blisters to keep straight.

Los Angeles-based Pallotta TeamWorks is a for-profit corporation that produces Avon's three-day walks. (Pallotta also produces Tanqueray's AIDS Rides and Pallotta TeamWorks AIDS Vaccine Rides.) Brian Pendleton, Pallotta's vice president of IT, says his main goal is to improve safety and tracking at these events—and save a little time and money in the process. For example, an online pledge system will reduce back-end processing costs so that more money can go directly to the charities involved.

On the front end, Pendleton will beta test chip technology some time this year. Fifty participants will attach to their shoelace a chip that contains a transmitter and a link to a database holding their identification and medical information. The chips let event producers track participants



Walkers in an Avon Breast Cancer 3-Day—prime targets for technology

along the routes and help in medical situations. For example, dehydrated participants stumbling into a medical tent will not need to recite their name, address and allergy information; volunteers and onsite doctors will have that information at their fingertips via the chip. "Pushing [technology] out into the wilderness is difficult," Pendleton says, but he's excited about the prospects.

As for me, I look forward to the day that technology will tell volunteers to hand me a snack along the route, because they've tracked my time and know I won't make it to the lunch pit stop before 2 p.m.

"I'M BECOMING THE SAME PERSON I HATED PREVIOUSLY."

—Tom Reinebach, executive VP, CFO and former CIO, Quality Stores, on becoming the CFO

PHOTO BY AP



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I N T R A N E T S

Top 10 Considerations for Enterprise Portal ROI

EXCITEMENT ABOUT corporate intranets wanes as they become "siloed" by business units. Companies are starting to look to enterprise portals as a remedy. But it takes significant investment to go from intranet websites to a "B2E" portal that will be a single point of entry for employees, partners and even customers, and provide not just information but self-service capabilities, workflow processes and even integrated application interfaces. The IT consulting company Logical Design Solutions of Morristown, N.J., offers the following points to think about when developing an enterprise portal.

1 ADOPTION It's simple: Small user base equals small savings.

2 AVAILABILITY 24/7 uptime and secure Internet access will maximize your investment.

3 USABILITY Few things will drive customers and employees away faster than a poor interface.

4 OPERATING COSTS Keep in mind that portals require maintenance and additional support personnel after the initial investment.

5 CONTENT PUBLISHING AND DISTRIBUTION Print only as a last resort and avoid "print friendly" formats that will only push your costs to the local level.

6 AUTOMATION Put self-service transactions in the hands of the user and employ call centers and other support staff to case management only.

7 OPERATIONAL EFFICIENCIES Think workflow. Decrease cycle time; reduce backsliding into less efficient habits.

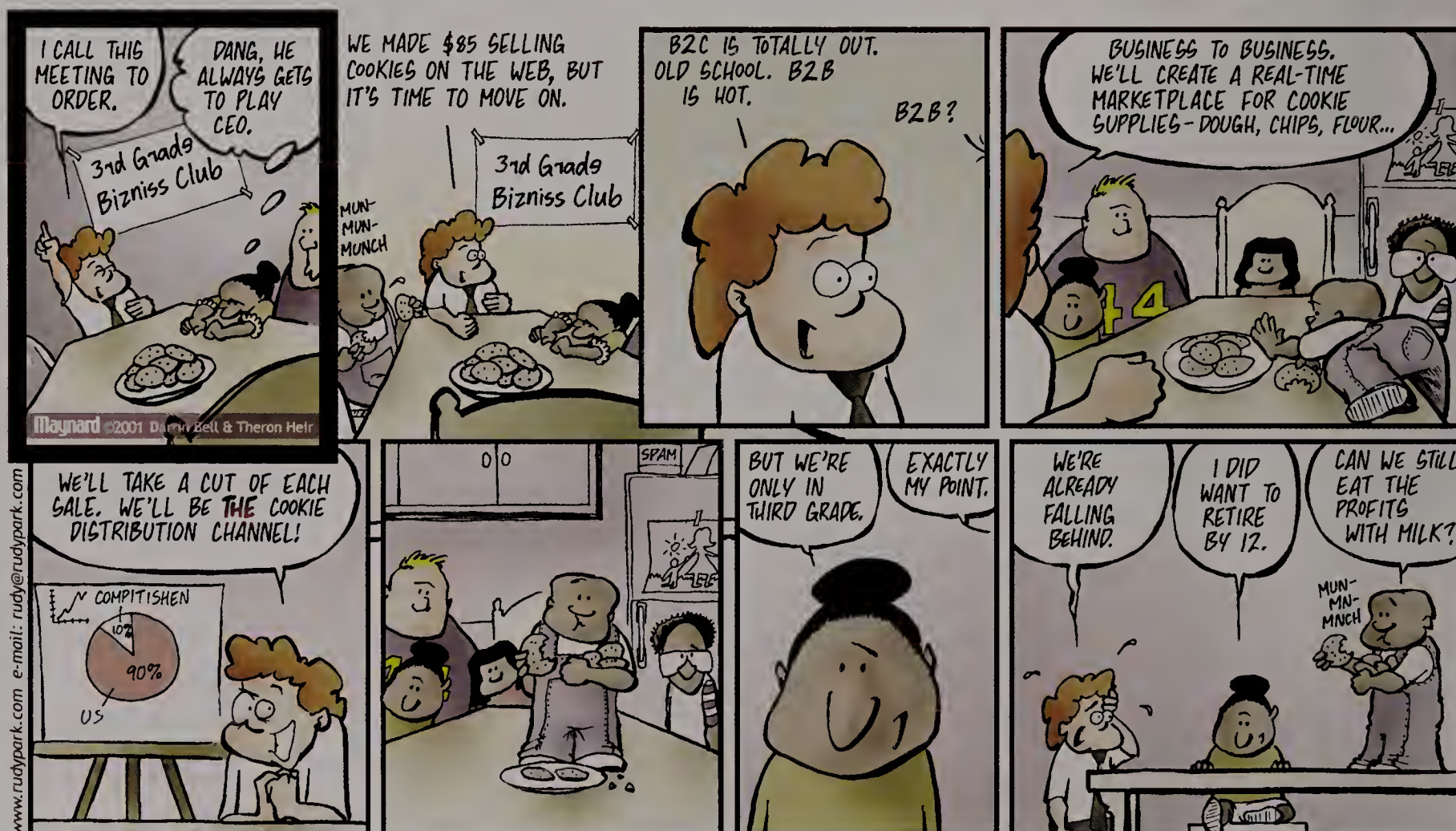
8 DATA ACCESS Use the portal as a thin, cheap, secure front end to legacy data.

9 COLLABORATION Reduce production and travel costs; increase efficiencies and corporate knowledge capital.

10 "SOFT ROI" OPPORTUNITIES Although difficult to quantify, gains in employee productivity, retention and communication are very real.

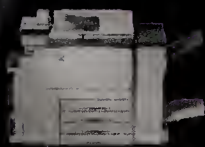
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By the Numbers

By Lorraine
Cosgrove Ware

Thin Clients Fatten the Bottom Line

I.T. BUDGETS are being squeezed. As a result, companies are investing in “slimmed down” PCs or thin clients to lower costs and ease computing complexity. Analysts expect thin client sales to grow almost ten-fold over current sales and reach 8.7 million by 2005, according to IDC (a sister company to *CIO*’s publisher, CXO Media).

Thin clients—desktop devices that exist only on a network, download applications from the server and store all of their applications and data on the server—give CIOs an easy-to-manage platform that can provide a higher ROI (in terms of money saved, through decreased IS support costs and faster application deployment than desktop PCs).

PC VERSUS THIN CLIENT: WEIGH THE OPTIONS

A configuration and selling price comparison shows that while PCs provide faster processors, local storage and flexibility—which you may or may not need—thin clients are cheaper and easier to manage

700MHZ PENTIUM III PROCESSOR

64MB to 128MB RAM

20GB hard drive

CD-ROM

Ethernet modem

Average selling price: **\$1,100**

300 NATIONAL SEMICONDUCTOR GEODA GXLV PROCESSOR

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No hard drive

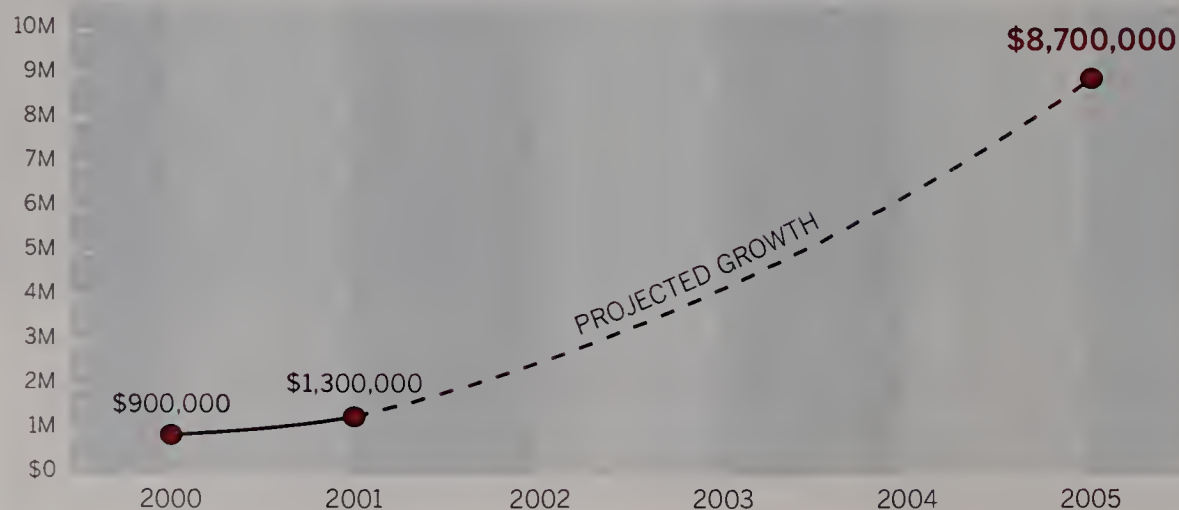
No CD-ROM

Ethernet modem

Average selling price: **\$573**

THIN CLIENT SALES ARE INCREASING

By 2005, thin client sales will grow by almost nine times the 2000 levels



“Thin clients are an IT manager’s dream. These devices can be managed and updated remotely, from one console. The control provided by thin clients will reduce your IT staffing costs.”

—Bob O’Donnell, research director of device technology at IDC

Best Practices

1. Assess your current infrastructure.

Thin clients require a highly reliable connectivity to a centralized server. “You’ll need a Windows 2000 server or NT Terminal Server Edition that has more storage capability and processing power to handle thin clients since nothing is stored on the devices and everything is stored on the server,” O’Donnell says.

2. When considering thin clients, CIOs need to find an area in their organization where they can deploy approximately 50 thin clients or more to see whether they are appropriate. Because thin clients are configured at the server level, setting up 100 thin clients is as easy as setting up one. “IT managers won’t see the benefit of thin clients by testing for usability and feasibility one at a time or here and there,” O’Donnell says.

3. Thin clients are not for everyone.

Select a department or area of the company where employees do very specific, highly standardized tasks, and deploy thin clients in a subsection of this department. Thin clients are a good fit in call centers, customer centers, claims departments, data entry, technical support desks, bank branch offices, and training centers or educational computer labs.

Suggest future topics to
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SOURCE: IDC

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NEW VENTURES

She's All That

By Lafe Low

DR. DRE, Snoop Dogg, Busta Rhymes—you've heard of these rap artists. But peep this: the rapper Rosabeth Moss Kanter? The college professor doesn't come outta South Central or Bed Stuy but the ivied halls of Harvard Business School. What's she doing with a rap song? "Evolve," recorded with Boston-based rap artist Mike Boston, is what Kanter calls an "alternative executive summary" that hits the main points of her latest book, *Evolve!: Succeeding in the Digital Culture of Tomorrow*.

Kanter met Boston through the community service organization City Year, with which they're both involved. "I wrote some verses while writing my book because I

wanted to take my conclusions from the boardroom to the community," Kanter says. "I wanted my message to reach the young people who get involved with City Year and not just executives and managers who would read the book." Proceeds from the rap CD and accompanying video benefit City Year.

Kanter uses the song to "rap up" her lectures too. "The lectures themselves are full of substance, so it's nice to have an inspirational and imaginative ending. I don't take it too seriously, and I don't expect anyone else to," she says. But listeners have loved it. It's been well-received among Kanter's col-

leagues in business, academic and City Year circles, who find her message about bridging the digital and generational divides a positive one. "Just pick a direction in this world of connection," she raps. "So many problems to solve—you've got to evolve."

So what's next for the rapping Rosabeth? A VH1 *Behind the Music* special? A world tour? Fans will be dismayed: She says this was a one-time production, a medium that suited the message.



Will Rosabeth Moss Kanter (left) join Busta Rhymes in the pantheon of rappers?

HOT TOPIC



STAFFING

Offshore Outsourcing Alive and Well

By Meg Mitchell Moore

AH, BARBADOS. Caribbean paradise, land of endless beaches, palm trees swaying in the ocean breeze, frozen drinks in pastel colors and information technology. Huh? Well, yes. As the economy in the United States continues to stumble, IT departments are looking for more ways to send their technology projects on a working vacation.

Last year *CIO* wrote about offshore outsourcing ("Hands Across the Waters," Sept. 15, 2000), a hot topic then because of the staffing shortage. Today, the biggest driver is the price tag. For example, Enherent, a Dallas-based IT solutions provider, contends that projects that go through its solutions center in Barbados (where the likes of J.P. Morgan Chase & Co. take their business) cost 30 percent to 40 percent less than what they would cost stateside. "Besides that, we have the ability to acquire the skills we need very quickly," says Nigel James, Enherent's general manager. "If the skill isn't there, we can import it from Asia and anywhere else. That's currently not so easy to do in the United States." (To read

about domestic outsourcing, see "Outsourced in America," Page 86.) And, he adds, Barbados has advantages over offshore options farther away: English is the primary language, the dollar is accepted, and the plane ride from the United States is short.

Other outsourcing companies can expect booming business from a slowing U.S. economy. According to a study from IDC (a sister company to *CIO*'s publisher, CXO Media), U.S. companies will spend more than \$17.6 billion on offshore outsourcing in 2005. A recent poll conducted by Syntel, an outsourcing company with headquarters in Troy, Mich., found that the pace of sending projects offshore is increasing, and Gartner analysts also predict accelerating growth in the area. Cost is the number-one justification, with availability of resources coming in second. India remains by far the most-used country for offshore outsourcing. But as more companies like Enherent get off the ground, CIOs may have other options. And they may find themselves explaining to their bosses why they really need to go oversee the project. In person.

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On the Move

Compiled by
Tom Field

Schlotzsky's New IT Menu

WANT TO SURF the Web while you wait for your deli sandwich? Try Schlotzsky's. The Austin, Texas-based restaurant chain aims to equip its 711 stores with iMac computers on which customers can check e-mail and surf the Web while they wait. This "digital-deli" campaign is part of Schlotzsky's efforts to stand out in a crowded fast-food marketplace. And it's just one of the many projects entrusted to the company's first-ever CIO, Robin S. Hanna, who joined Schlotzsky's in April.

Hanna—an IBM veteran who left Dell Computer in 1998—is charged with help-

ing improve Schlotzsky's bottom line and business processes through deployment of Web-based technologies. Hanna believes her high-tech industry skills are eminently transferable. "You can almost relate building a sandwich to building a computer," says Hanna. "There is a chain of events to doing both at the lowest cost and best quality. It's all components."

Hanna picked a tough time to join the 30-year-old chain. It has struggled since 1999, seeing its stock price diminish from a 1996 IPO value of \$11 per share to \$4.90 per share in late May. Shareholders have

pushed the company to focus less on expansion and more on improving same-store sales, trimming costs and reducing commercial bank debt.

But this also presents Hanna with a prime opportunity: to turn all available resources toward initiating radical business



Robin S. Hanna

change using IT. She's prioritized credit card processing systems, new point-of-sale systems, e-procurement with suppliers, and an intranet for franchisees—all of which should help the restaurants operate faster and more efficiently.

In her first three months, Hanna and her team created a new look for Schlotzsky's website (www.cooldeli.com), placed operations manuals and contact information online for franchisees, and put more energy into the digital deli program. Through this flurry of ambitious and sometimes uncharted projects, Hanna says she continually asks herself, "At the end of the day [if the systems fail], can we still make a ham sandwich in our restaurants? The answer is yes. My job then is to help to make them faster."



Player's Guide

Thistlethwaite Now CIO at Blockbuster

Glenn Thistlethwaite, former senior manager and consultant for PricewaterhouseCoopers, has joined Dallas-based Blockbuster as senior vice president and CIO. In his new role, Thistlethwaite is charged with transforming the IT organization into a more business-focused department.

Morrow Named VP of IS at 7-Eleven

Keith Morrow has been named vice president of information systems at 7-Eleven. Morrow joined the Dallas-based company in January to lead its IS division. Before joining 7-Eleven, he was a senior manager at ADP and senior vice president of e-commerce at The Associates First Capital, now CitiFinancial Mortgage.

Other Moves

Jeff D. Kubacki, former director of IT, supporting global services for Dell Computer, has been named vice president of information technology and

software quality services at Catalina Marketing in St. Petersburg, Fla.

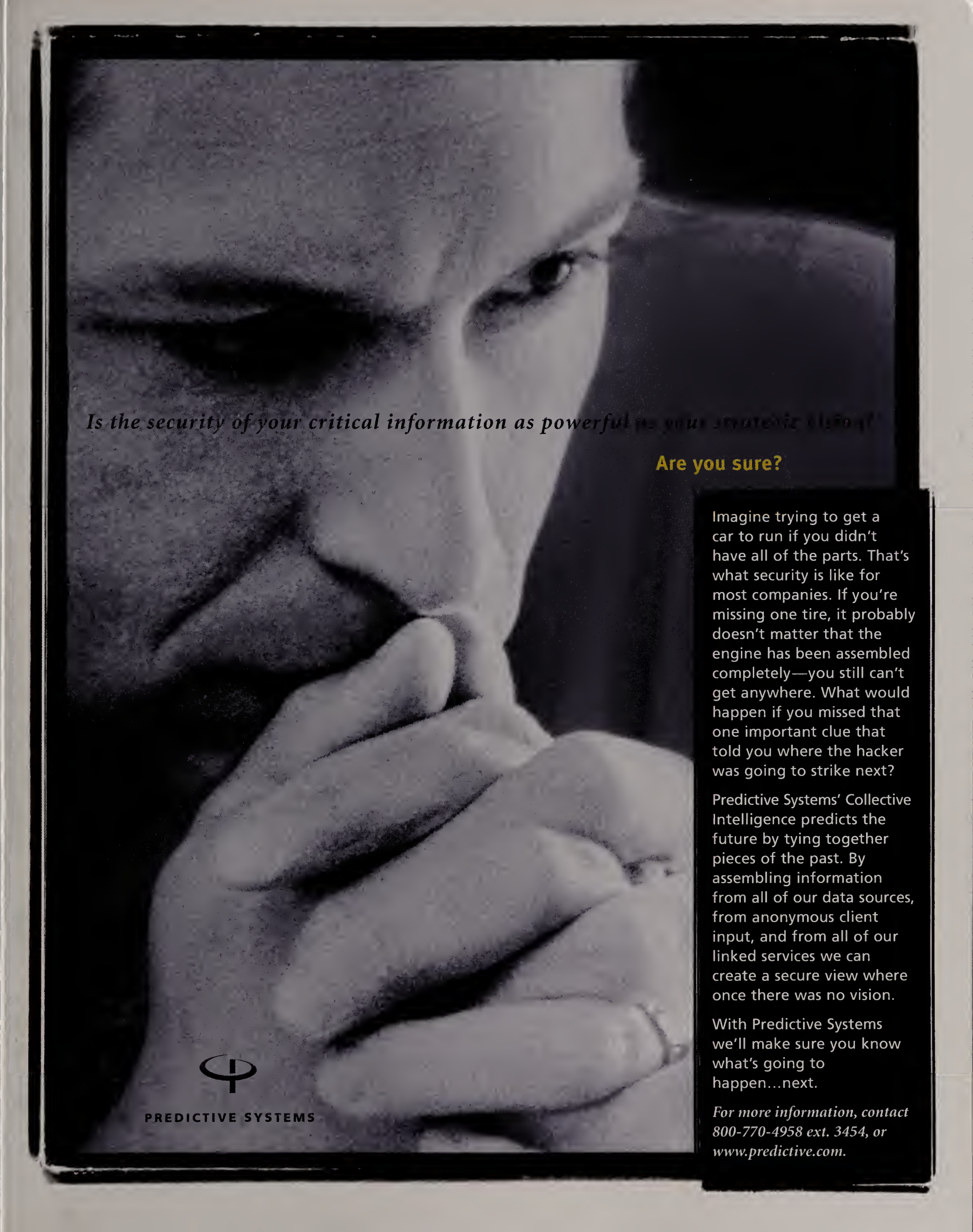
Vio Nicola, former vice president of operations and CIO for Adspace Networks, has been named director of information technology at Ameristar Casinos, a Las Vegas-based gaming company.

David O'Brien, former CIO at Credence Systems, has joined FEL, a Hillsboro, Ore.-based developer of 3-D technologies, as CIO and senior vice president.

Arnie Rind, former vice president of information systems at Randstad North America, has been named CIO at Adecco North America, a Melville, N.Y.-based staffing service company.

Richard G. Turner, former CIO at the Federal Trade Commission, has been named CIO of the National Security Agency.

Daniel Yee, former CIO at California Power Exchange, has been named CIO at the California Independent System Operator in Folsom, Calif.



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Imagine trying to get a car to run if you didn't have all of the parts. That's what security is like for most companies. If you're missing one tire, it probably doesn't matter that the engine has been assembled completely—you still can't get anywhere. What would happen if you missed that one important clue that told you where the hacker was going to strike next?

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PREDICTIVE SYSTEMS

MERGERS AND ACQUISITIONS

Dutch Masters?

By Daniel J. Horgan

A RECENT FLURRY OF ACQUISITIONS led some in the IT community to murmur that a new monster might be lurking across the horizon: a quiet giant with a long mercantile history and a penchant for wooden footwear. Some American companies recently swallowed by this wave from the Netherlands are the Silicon Valley Group, bought out in April by Veldhoven-based ASM Lithography Holding, and Macola Software, acquired by Delft-based Exact Holding in February. It's happening to overseas companies as well. Supply chain management company TNT Post

Group, headquartered in Amsterdam, acquired French logistics company Barlatier in July and Italian logistics company ALS in May.

Could your company be next? When asked if the world should brace itself for Dutch IT hegemony, Simon Bragg, European research director in the London office of ARC Advisory Group, responds, "No, not at all."

Phew! But why not?

Innovation clearly is not lacking in Europe (Linux was founded in Finland, MP3 in Germany and the World Wide Web by a Brit in Switzerland), but marketing of innovations proves to be most inhibiting. "Commercialization of technology has been a tricky feat in all of Europe due to the region's

fragmented marketplace, language barriers and cultural disparities," Bragg points out, although the strengthening European Union may change that. The United States still dominates, he suggests, with commercialization a major ingredient in its leading status because of Americans' greater willingness to risk failure and to spend money. "For example, the U.S. spends twice the percentage of GNP [on application software] that the Europeans do," Bragg says. "A U.S. [decision] failure will not necessarily cost the CIO their job; a European failure will."

The spate of acquisitions by Netherlands-based companies then appears to be just a result of the sporadic distribution of such things throughout the market, which sometimes pile up to look like a trend. So you can sleep easy for the time being, because a new era of Dutch world colonization has not yet arrived. But then again, with its multilingual society, broad cultural tolerance and social elasticity, the Netherlands could be in the best position to make such a move.



WIRELESS

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TALK ABOUT A LONG-DISTANCE CALL—

astronauts aboard the International Space Station (ISS) orbiting miles above Earth are now phoning home. ISS astronauts use Cisco Systems SoftPhone software running on flight-approved laptops through a voice-over-IP (VoIP) system. "There's basically a network on board, a network on the ground, and we connect the two," says Matthew Bordelon, project manager for crew support laptops at the Johnson Space Center in Houston. The first flight test calls were placed from the space shuttle *Atlantis* in February. The system is being tested for use aboard the station in the future.

ISS astronauts will use the VoIP system to keep in touch with family and friends. The ability to make private calls has psychological benefits for the astronauts, Bordelon says. Up to now, astronauts communicated via radio calls routed through the Mission Control Center (MCC) in Houston—effective for transmitting mission data but a little public for astronauts wishing to exchange greetings with loved ones. Friends and family would either visit the MCC or a teleconference would have to be established for them to make contact.

The only seemingly unavoidable glitch so far is the satellite link delay of a few seconds in voice transmissions. Satellite availability can cause additional delays of up to several minutes. "Most of the time, it's less than one second," Bordelon says.

Still, extraterrestrial workers do phone home—ET would be jealous.

—Lafe Low



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Total Leadership

Tough Enough?

It's a harsh world out there, and CIOs must be able to handle it. Here's how to get the job done.

BY PATRICIA WALLINGTON

"ARE YOU TOUGH ENOUGH to do this job?" I got the best job of my career with my answer to that question. But more about that later. I'm sure you've heard the saying, When the going gets tough, the tough get going. It certainly seems to be a mantra suitable for today's business environment. These are times when tough is not only advisable but imperative.

How do leaders muster the courage to do the tough things? How do you know when tough is good and when it isn't? What do you do to keep your sense of balance during these periods? Over the years I've learned some lessons that may help you.

What Is Tough?

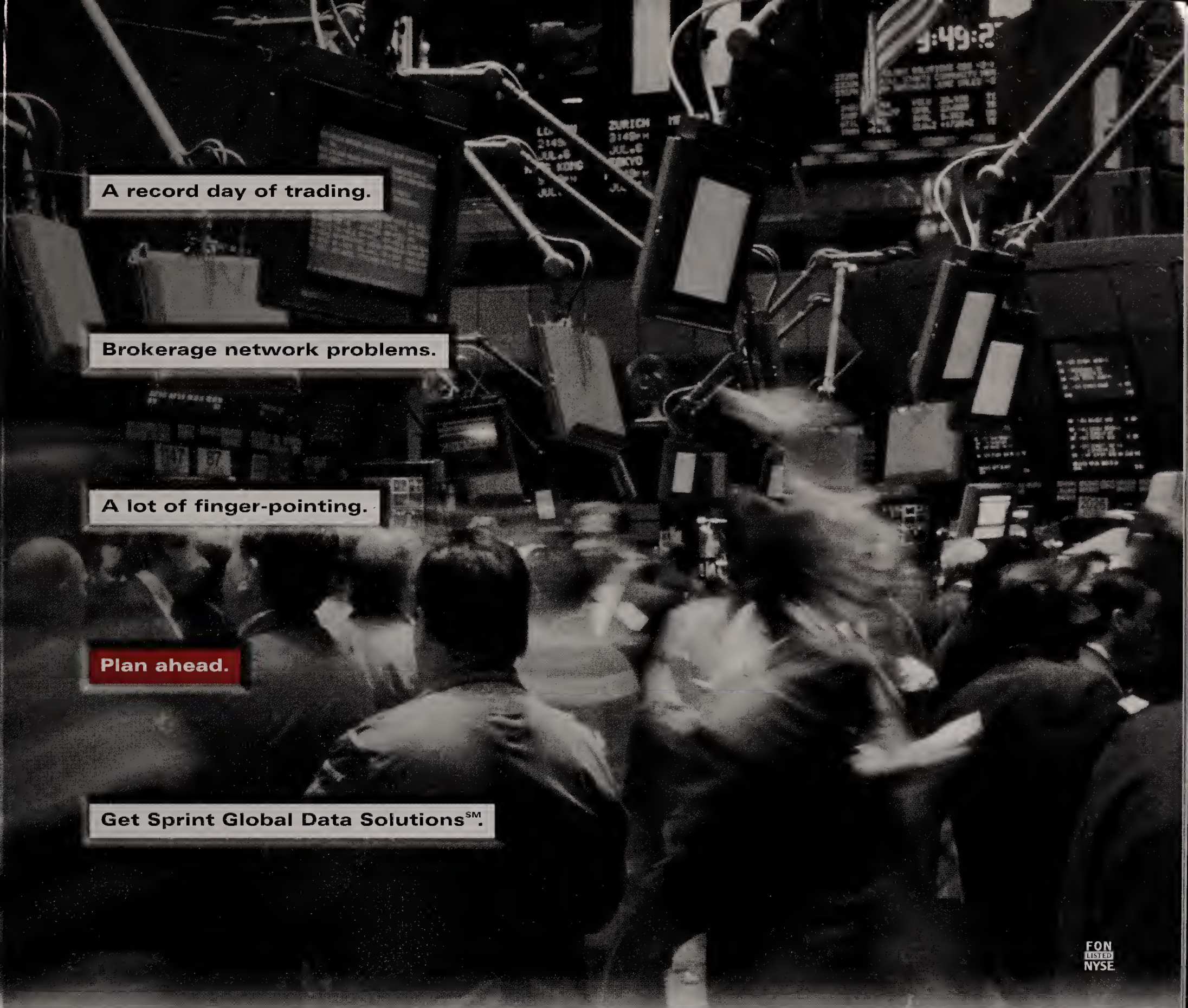
Whether making tough decisions, implementing tough actions or giving tough feedback, there is one overriding rule: *Act* tough, but don't *be* tough. Don't be personally hardened by the need for difficult actions. Always keep in mind that people's lives are affected by your decision and by how you communicate and implement it. As Gen. Dwight D. Eisenhower said, "You do not lead by hitting people over the head; that's assault, not leadership."



Firing someone is probably number one on everyone's list of tough things to do, followed closely by giving a negative performance review. Significant changes in business conditions also call for difficult decisions and the painful implementation of them. For example, shutting down a business, factory, project or product with the attendant layoffs is common headline material today. Cutting costs at any level requires decisions and actions that seem onerous at the time. But leaders must be able to execute all of the above skillfully, not only for the sake of the individual but for the survival of the enterprise. The need for tough actions cannot be wished away or waited out. The longer you take, the worse it gets—for everyone.

There are many reasons we tend to try to avoid the tough actions. Most of these actions involve conflict, for instance, and conflict generally feels negative. Sometimes there is an implied criticism of a person or of previous decisions. Tough decisions

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almost always involve aggressive, rock-the-boat kinds of actions and take a great deal of personal courage. We like to be liked, and being tough gets in the way, at least in the short run. But whatever our particular reasons, none can be justified if you take the proprietor's view. This is your company, no matter where in the hierarchy you sit. As proprietor, you must exhibit great strength of commitment and willingness to take personal risk.

The Seven Rules of Toughness

What does it take to be tough enough? Follow these rules:

1. Be compassionate.
2. Don't delay the inevitable.
3. Don't forget that it's your job.
4. Walk in their shoes.
5. Do not panic.
6. Talk often.
7. Look for the silver lining. -P.W.

Getting Tough

OK, I'll do it, but how do I do it well?

The first time I had a serious performance issue to deal with, I struggled to help the staff member overcome his problems. We spent many hours in reviewing, counseling and coaching. Despite all this effort, we did not make progress. Ultimately I had to gather the courage to tell him he was going to lose his job.

Here was a smart young man who was just not able to get the art of programming. I knew he would be successful at something else and told him that. It was a devastating day for both of us.

Many years later, this young man sent me a letter to let me know what a positive effect I had on his life. If he hadn't been fired, he might still be struggling to succeed at something he could never do well. Instead he became a lawyer and was very successful. The key, he said, was forcing him to confront reality.

Not all situations will be as simple as this one or result in such satisfaction, but there are a few steps that may help address a variety of difficult circumstances.

■ **Turn on the spotlight.** Identifying the problem and calling attention to it is the first step. Exposing it to light helps to clarify the real issues rather than the symptoms.

■ **Think positively.** Attitude counts for a lot. Be constructive, not destructive. Try to find a solution that meets the greatest set of sometimes competing objectives. When Xerox was considering outsourcing, we did roundtables with employees of the competing vendors to try to understand how they felt before, during and after they were outsourced. They gave us extremely valuable advice.

■ **Do your homework.** Consider as many alternatives as pos-

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sible before narrowing to your final decision. Even in a business turndown, avoid the tendency to hip-shoot a solution. Your current strategy is based on a set of assumptions. Examine the assumptions and make appropriate changes. Then determine if the strategy needs changing. Be sure you don't panic. Your actions will set the tone for the whole organization.

■ **Rally support.** Communicate, communicate, communicate—honestly—to all who are affected, customers or employees. Focus on what you can affect—performance, productivity, revenues, costs. Don't waste energy on what you can't.

■ **Brace yourself.** Recognize that tough actions will generally not be popular ones, at least in the short run. Prepare yourself mentally for the storm of protest. (Remember the "Neutron Jack" label assigned to Jack Welch, the CEO of GE.) Also recognize that everyone is affected indirectly, if not directly. After a layoff, those who stay are sometimes more stressed than those who go. You will have to face a lot of negative energy in the workplace at such times, and that can be exhausting. It is important to be as physically fit as possible.

■ **Look for the silver lining.** Keep morale up by focusing on areas of improvement not possible during busier times. Education and development can flourish and better prepare

everyone for the next upturn in the business.

■ **Ask three questions.** When you are struggling with a tough decision, the following three questions bring things into focus. Am I doing the right thing? Am I doing it for the right reasons? Am I doing it in the right way? Answer yes to all, and your direction is clear. Any "no" answer should cause you to rethink and adjust accordingly.

Tough Enough?

To the question asked of me in the interview, my response was, "I know I am tough enough, because I've done this before. The real question is, Are *you* tough enough—tough enough to stand behind me when the going gets rough?" I got the job *and* the support necessary to be successful. **CIO**

How do you define "tough enough"? Let us know at leadership@cio.com.

Before retiring in 1999, Patricia Wallington was corporate vice president and CIO at Xerox. In 1997, Wallington, now president of CIO Associates based in Sarasota, Fla., was inducted into the Women in Science and Technology Hall of Fame and named by *CIO* one of the 12 most influential IT executives of the decade.



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GLOBAL BUSINESS

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Paul Stevens of Barclays Global Investors battles communication gaps that span continents.

Also Inside

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How to Win at International Politics

Integrating fragmented IT at Barclays Global Investors would be a lot easier if not for the people **BY MALCOLM WHEATLEY**

DESPITE THE EARLY HOUR, THE MORNING SUN is already beating down on the top of an office building on Fremont Street, in the heart of San Francisco's financial district. It's the headquarters of Barclays Global Investors, and its global head of technology, Paul Stevens, is already at work, having arrived at 6:15 a.m. even though he flew in from London late the previous night.

At least one week a month (sometimes two), Stevens is in San Francisco, where most of the company's top managers are based. The rest of his time

is spent in London or shuttling between corporate offices in Sydney, Australia, Toronto and Tokyo. Barclays is the world's largest institutional investment management company; it handles more than \$800 billion in assets for more than 1,900 clients in 37 countries—mostly pension funds for global giants such as Citibank, General Electric, General Motors, Sony and Toshiba.

It's the dawn of a typical workday for Stevens—managing his far-flung, multicultural global IT empire. The secret of his success, revealed as his day



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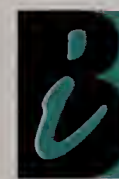
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unfolds, is deftly dealing with the true nemeses of global companies: people politics and cultural conflicts.

The politics are aggravated by Barclays' heritage of multicultural mergers. The business is the culmination of a series of mergers and acquisitions that bolted Nikko Securities, a Japanese bank, on to San Francisco-based Wells Fargo & Co. before the whole caboodle was sold to London-based Barclays Bank. IT was not only fragmented globally but also splintered within offices; the funds management function, for example, has a wholly different IT setup from the fixed interest securities group.

Britisher Stevens, headhunted from Wall Street in 1999 after five-and-a-half years at J.P. Morgan, was given a simple mandate: Sort it out and stick it all together.

Can't We Communicate?

Fulfilling the mandate hasn't been easy, Stevens says with a sigh. "People aren't physically colocated and are culturally very different," he says. "Communication is a perennial problem. I have to do a better job at communicating; my direct reports have to do a better job at communicating—but the people who are listening have to do a better job at listening."

One of Stevens's early communication innovations was a rolling global program

people who report to me but the people who report to them," Stevens says. The agenda is open: "You can ask anything you want, provided you ask it politely," he says.

Yet even this carte blanche proved problematic. Sometimes predictably, of course. "Go to Tokyo, and no one asks any questions, and you know that they're never going to ask questions," Stevens says. But perhaps surprisingly, he says, although the meetings work well in Sydney and London, it's the San Francisco meetings—such as the one he will host later today—that place second in the tight-lipped stakes. "People are very reticent about coming forward," Stevens says. "I'll say, 'Please speak freely,' but no one says anything, and later we'll find out that there were problems."

So last year, Stevens tried to eliminate such standoffish behavior. First he figured out that he and his direct subordinates had been communicating the wrong message. Instead of jumping straight in talking about proposed solutions, Stevens and his lieutenants needed to prove that they'd identified the right problems to solve in the first place.

The reason: A perception that Stevens and his team weren't credible when it came to technology. The programmers, for example, hold widely diverging views—prompting what Stevens describes as holy

“People are very reticent about coming forward. I'll say, 'Please speak freely,' but no one says anything.”

—PAUL STEVENS, BARCLAYS GLOBAL TECHNOLOGY OFFICER

of “Sit Down with Paul Stevens” sessions. Wherever he is in the world, time is found for Stevens to sit down for a town hall meeting with a selection of a dozen or so employees, including programmers, administrators and data center staff. “Not the

wars over technology choices. “People in London think that Visual Basic is perfectly acceptable, while people here in San Francisco spit on Bill Gates's shoes and want to use Java.”

The solution: Geek shall speak unto

AT A GLANCE

Barclays Global Investors

The Business: Barclays Global Investors manages nearly \$800 billion in pension and investment funds around the world. It counts 33 percent of the world's largest pension funds and 28 percent of the Forbes 500 as clients.

The Challenge: The company's IT function has been fragmented, resulting in higher costs and missed opportunities for synergy. The global technology officer's mission is to weld the pieces into a whole. His biggest hurdles are political and cultural.

The Solution: A culturally sensitive global juggling act focused on communication and development of buy-in for IT integration and standardization.

geek. And if Stevens himself isn't seen as a credible enough geek, he is more than happy to put together a team of uber-geeks who are seen as credible and task them with resolving the debate.

The result: They developed a written framework—a “technology triangle”—spelling out cost versus functionality versus technology trade-offs of any choice, and five rules of the road that guide the decision process.

Building Buy-in

In a further move to come to terms and open up the dialogue, Stevens gathered some 45 people from around the world—analysts, developers, infrastructure specialists and support personnel—whose one



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common factor was that “they were seen as people we had to win over.” A two-day retreat held in Sonoma, Calif., aimed to do precisely that. Through a process of guiding, cajoling and explaining, Stevens and his team convinced this core group that management had indeed identified the right solutions to the right problems—not just on technical issues but the whole strategy, direction and priorities of the fledgling global IT function. The group, in turn, took the message back home.

With the communication roadblocks removed, the pace of progress has sharply accelerated as Stevens seeks to coax globalization from his international motley crew.

Back to the business at hand, Stevens holds a scheduling meeting with his assistant, Barbara Hornsby, a rarity in a relationship transacted by e-mails and telephone calls—the inevitable consequence of Stevens’s London base and Hornsby’s loca-

tion in Walnut Creek, Calif.

Next comes a telephone conference with London and Sydney. The discussion is about how to hold the company’s data on funds and clients in the same way in every

“I have to do a better job at communicating—but the people who are listening have to do a better job at listening.”

—BARCLAYS’ PAUL STEVENS

office around the world. The objective is to reap the advantages of a standardized process without losing any of the information on which local offices rely. With representatives from IT and the business areas that would be affected, the debate is vigorous but good-humored. While the call is an attempt to solve a technology problem,

it’s also part of an ongoing effort to manage sensitive office politics.

Some years ago, Stevens explains, Barclays stirred the flames of political ill will when the globalization project foundered,

turning into a niche Y2K fix for the U.S. business alone. That antagonized the overseas offices. Now the project aims for smaller, more achievable goals. It has cochairmen representing different countries and has much more business buy-in from around the company.

One example of the subsequent progress made is OrdersOnline, which enables institutional clients to place orders over the Internet. Before, Joe Soap could trade online through the likes of Charles Schwab, but an institutional client wanting to place a \$10 billion trade was forced to use a fax, replete with authorized signatures—a process that could take days. No longer. Earlier this year, Barclays Global Investors became the first institutional management company to offer online trading accompanied by personalized client content.

It was, concedes Stevens, “an obvious go-get.” Yet it was one that the politically charged company overlooked as it wrangled over how best to exploit the Internet.

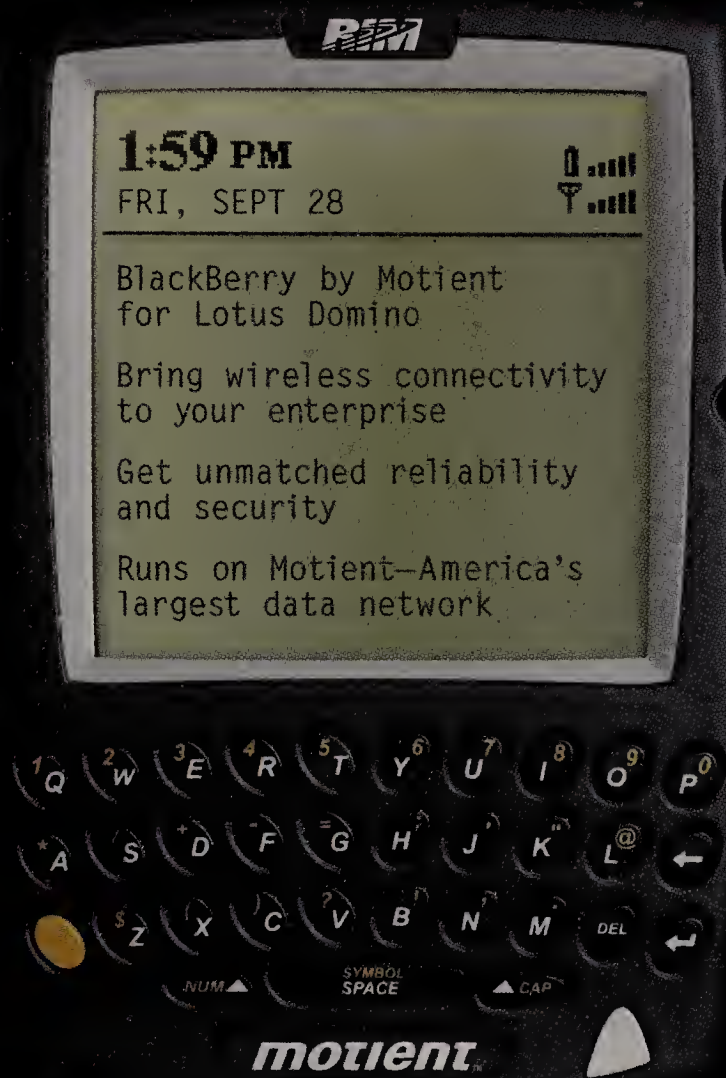
Once the conference call concludes, Stevens prepares for the next series of appointments: The rest of the day will be back-to-back meetings. “When people know I’m coming, my calendar fills up very quickly,” he says. To cope, he’s had to develop iron discipline: “Time management, agenda-setting, firmness in running



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a meeting—these become incredibly important when time is rationed.”

Perpetual Time Zone

How do Stevens's lieutenants feel about serving a boss who's rarely in any one location for a reliable period of time? Nancy Tognela, based in San Francisco, manages the IT group's worldwide administrative arm. She keeps a mental clock tuned in to Stevens's current time zone and admires the way he keeps in touch from wherever he is. “He's very committed to weekly meetings,” Tognela says. “We're always on the schedule, even though we occasionally get bumped at the last minute.” The only downside is the early morning or late night appointment, depending on where Stevens is.

Another person who counts on Stevens's accessibility is Craig Squires, an Australian based in Walnut Creek who runs the company's 10 data centers and global networks. Previously based in Sydney, Squires has been in the United States for more than two years. But he'll soon be heading back to Australia; he figures he can run the global network just as easily from there. Help desk support is already run globally, he says, rather than from national offices.

“There's a libertarian streak running through the business here. People tend to think that corporate assets are their own.”

—CRAIG SQUIRES, BARCLAYS GLOBAL HEAD OF I.T. INFRASTRUCTURE

“If you look at where our offices are located, there's never a time when we don't have people at work,” Squires explains. Capitalizing on that, the company is now able to support users around the world from whichever office is working normal business hours. The result is lower employee turnover, as fewer help desk peo-

ple have to work antisocial hours.

The switch to distributed help desk support will be made even easier by the adoption of a single Windows 2000 global desktop, complete with approved standardized applications, Squires adds—a decision that once again highlights cultural differences. While developers in London and Sydney are sanguine about the switch from Windows NT 4, it's seen as something of an imposition in San Francisco, where developers in particular want more freedom in their choice of applications and desktop configuration. “There's a libertarian streak running through the business here,” Squires says. “People tend to think that corporate assets are their own.”

HR on My Mind

Stevens heads for a final round of meetings. The first is with Jeff Seretan, head of global human resources. The formal topic is quickly dealt with—the implementation of PeopleSoft 8, which went live in Sydney the week before and will next be implemented in Tokyo. Stevens and Seretan briefly review project leaders for each implementation, congratulate themselves for resisting the temptation to customize the out-of-the-box

prime concerns, prompting the need for the assessment.

As Seretan talks through the new process, Stevens nods approvingly. Clearly, it fits the bill. Assessing people on three dimensions—performance, adherence to corporate values and promotability—dovetails well with two of Stevens's concerns.

First, it avoids the so-called forced distribution method of assessing people, which disregards absolute performance in favor of relative performance. “[Forced distribution] doesn't recognize that there can be people in the lower quartile who can make a valuable contribution keeping some production system going,” Stevens says.

Second, it provides a formal framework, which Stevens reckons is essential in a global organization. “This is a real hot button, and we've got to get it right,” he says. “People are always complaining to me that it's easier to get promoted in the U.S. than in London or Sydney.” Using the framework, Stevens will be able to answer those complaints. “When it comes to the hard decisions, people around the world can at least understand them, even if they don't like them.”

Which sort of serves as an introduction to Stevens's last meeting of the day—the promised “Sit Down with Paul Stevens” session. There are beefs and gripes aplenty—particularly about the implementation of the new Windows 2000 desktop—but they are tinged with genuine concern about the future prospects of the business in the down market. Despite the occasional cultural chasm—highlighted by the blank looks when Stevens quotes Britain's Victorian-era Prime Minister Benjamin Disraeli—it's a shared bond that links together an organization spread over thousands of miles.

It's been a long day, but Stevens still has one more task to perform. “Gotta check the e-mail,” he mutters. Somewhere out there, people are waiting for an answer. **CIO**

Q & A | VINNIE MIRCHANDANI

Trouble Offshore

VINNIE MIRCHANDANI has spent nearly two decades as a multinational consultant with Price-waterhouseCoopers, Gartner and now with his own Chicago-based company IQ4hire. These days he's casting an acerbic eye toward IT service providers, helping clients better manage their systems integrators and consultants.

Q: Outsourcing software development to countries such as India is very popular. But you're more cautious. Why?

A: The risk factor has increased. Buyers' expectations are going through the roof, and sellers are becoming very fragmented. The buyers who helped open the market were sophisticated, understood the risks and had strategies for dealing with them.

Now we're seeing mainstream companies from places like the Midwest handing projects over to second-tier Indian firms that don't always have the required depth. And people are getting burned. Compared with software procurement, service procurement has never been very sophisticated. Companies take six months for software selection, yet jump into bed with the first Indian company that they meet.

Q: So what exactly are the risks?

A: The good news is that they are more managerial than technical. Indians tend to avoid confrontation and aren't as aggressive in terms of project management when things start to go wrong. The work ethic is different as well. Compared to the U.S. model, the Indian model is closer to the European work model—there are evening cutoffs, for example, and weekends are sacred.

Q: What's your advice to U.S. companies that are contemplating outsourcing to India?

A: More than ever, it's caveat emptor. It's still a compelling business model, but it's become so wildly successful that buyer and seller expectations are going to be hard to keep up. Buyers who think projects will come in at 20 percent of the U.S. cost are simply naive; realistically, the costs are 60 percent to 70 percent.

—M.W.



If you ask IBM, e-business is complicated and hard.

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*By creating a single database
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Manager **Jane Walton** saved
the company \$3 million in
the first year*

Do the MATH

If you want business credibility, you need to use business tools. Project portfolio management can help align IT, manage value *and* get you a seat at the big table. BY SCOTT BERINATO

At Schlumberger, it started by accident, as these things often do. One curious IT staffer asked his peers what projects they were working on and amassed the answers in a spreadsheet. When Jane Walton, then an IT analyst for the Austin, Texas, IT services company, saw that spreadsheet, she felt the blinding rush of an epiphany. The spreadsheet included just a small sample of the company's IT projects—120 in all—but it revealed that 80 percent of the projects overlapped. There were 14 separate projects trying to accomplish the same thing with customer-facing websites, for example.

That was late in the booming '90s, when managing IT value—even defining it—was already a mounting struggle. Then again,

because it *was* the booming '90s, the struggle hadn't yet reached life-and-death proportions. Even if you couldn't define IT's value explicitly or manage it precisely, few seriously doubted its worth.

But Walton's epiphany was that corporate executives everywhere soon would be questioning the value of IT. Sure enough, on the back end of the mad rush to the Internet, CEOs began to turn the screws. They asked, "What are we spending all this money on and why?" It was much like what happened in manufacturing in the '60s, Walton realized: After a long boom, a slumping economy was causing long-held assumptions about value to be called into question. The result, she knew, was that IT would soon have to prove it or lose it.

So Walton proposed that her IT depart-

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- ▶ Understand why portfolio management gives CIOs a stronger voice at the executive level
- ▶ Learn why IT is no longer special—and why you should be glad

ment do the same thing manufacturers did back in the 1960s: project portfolio management. The spreadsheet ought to be turned into a database that would catalog all IT projects. It would quantify risk and return, prioritize and align IT projects with the business. It was a grand plan, and it met with blank stares. "I probably took the wrong approach," Walton says in retrospect. "I probably should have approached this incrementally, but I was so passionate."

Eventually the economic crash came, and Walton's analogy to 1960s manufacturing was complete. And that brings us to today. In this indolent economy (see "Your Budget Playbook," *CIO*, Sept. 1, 2001), demonstrating and managing IT value is becoming the sine qua non of getting new projects off the ground and keeping old ones running. For some CIOs, IT project portfolio management is doing the trick. At Walton's company, the blank stares have disappeared. And her new title is portfolio manager.

A CENTRALIZED VIEW

Project portfolio management is pretty much just what it sounds like. You collect and control your entire suite of IT investments as one set of interrelated activities in one place—a portfolio. In addition to providing a centralized overview of all IT projects, a good portfolio will make it easy for CIOs to make sure their IT investments are well-balanced in terms of size, risk and projected payoff. Used wisely, it will actually increase IT's value by exposing projects that are redundant or too risky, while revealing how

Getting Started on Portfolio Management

Do

- **Get out of IT.** Learn portfolio management from the experts, such as CFOs and actuarial scientists. Take a class.
- **Read Harry Markowitz's *Portfolio Selection: Efficient Diversification of Investments*** (Blackwell Pub., 2nd ed., 1991).
- **Start small.** Just trying Level 1 (see Page 56) will yield results.

Don't

- **Read books or white papers about portfolio management written for IT.** The term has already been widely abused, so you may be reading about something else entirely.
- **Trust a vendor that says it will sell you portfolio management.** PM is not an off-the-shelf concept.
- **Try this with a highly distributed budget.** Centralization is implicit, starting at the most basic level. —S.B.

to shift funds from low-value investments to high-value, strategic ones.

The serendipitous beauty of project portfolio management is that it's actually impossible to do it without being aligned with the business, because creating a portfolio requires close collaboration with the business. It will elevate the CIO in other executives' eyes because he (finally) will be speaking in their native tongue. A well-managed portfolio will also reward CIOs with a seat at the big table and a larger role in influencing business strategy. Of course, the price for that influence is accountability: Portfolio management makes IT completely responsible for its actions.

If the term *portfolio management* is brand new to you, take a stroll to the CFO's

office. PM is old school to CFOs and anyone in finance or insurance. Harry Markowitz invented it in the '50s and later won a Nobel prize for it. His Modern Portfolio Theory is the most rigorous form of portfolio management, using a set of specific mathematical equations for measuring risk versus return, quantifying the decision-making process and determining value.

Rare is the IT shop using Markowitz's portfolio theory, which is why our definition of portfolio management is so broad. Ask seven CIOs what portfolio management is, and you'll get 10 answers. So we've encompassed a spectrum of practices, from implementing a simple database to applying Markowitz's dense economic math.

The good news is that applying any one of the practices is beneficial; the spectrum can even be treated as a journey from the most basic to the most advanced tools. The bad news is that the approach's amorphousness has vendors pouncing. Portfolio management is quickly escalating to the dreaded buzzword status.

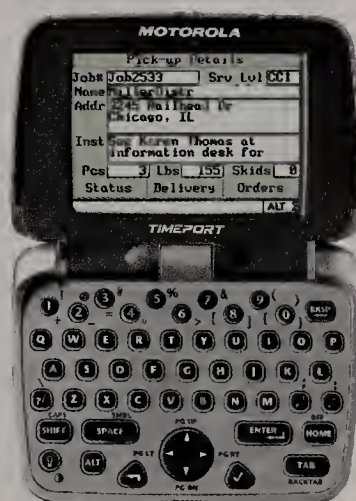
"It's tremendously frustrating," says Howard Rubin, Meta Group executive vice president in Pound Ridge, N.Y., who has been pushing IT project portfolio management for years. "It's like the word *value*. It sounds important, but it's wildly misused.

How to Organize Your Portfolio

Elements that go into the database at Level 1 of portfolio management

- | | |
|---------------------------------------|--|
| ■ Project Name | ■ Estimated Number of People Required |
| ■ Technologies Employed | ■ Scope (Departmental, Cross-Enterprise, or Global) |
| ■ Estimated Time to Completion | ■ Basic Risk-Value Calculation |
| ■ Estimated Cost | ■ Business Justification |

—S.B.



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THE FIVE LEVELS OF PORTFOLIO MANAGEMENT

To avoid abusing the term, we'll lay out exactly what we think portfolio management ought to be. Here are our five levels, from simplest to most complex.

LEVEL 1 Put all your projects in one database. Portfolio management starts with a database of project names, descriptions, estimated costs, estimated time frames and staff members assigned to work on the projects. Collecting all that data may be a chore, but it can yield impressive results in the end.

"The biggest benefit to us was being able to spot redundancies," says Dan Vantucci, vice president of IT at manufacturing company ITT Fluid Technology and Specialty Products in Upper Saddle River, N.J. Vantucci found that multiple organizations in ITT were working on very similar projects. For example, seven divisions were each planning to build Web-based engineering change-notice capability. "Instead of doing the project [many] times over, we did it once and rolled it out to [multiple] organizations," he says.

Vantucci's database resulted in savings of \$4.5 million. His group also took home two best practices awards handed out in the company in May.

At Schlumberger, Walton has now cataloged about 1,000 projects, and there's still more to go. But by eliminating the redundancy alone, she saved the company \$3 million in the first year.

Financial rewards aside, the consolidation of projects into one database often produces immediate gratification for CIOs because for many it is their first holistic view of what's going on in their department. "We found when we started this that we really didn't



The ability to spot redundancies helped Vice President of IT Dan Vantucci save \$4.5 million at ITT Fluid Technology and Specialty Products.

know what our total technology spend was because divisions were spending without talking about it," says Marvin Balliet, CFO of Merrill Lynch's Technology Group in New York City.

Balliet is not alone, however. Just *why* IT has gotten away with this inattention is the product of enough cultural and organizational assumptions and prejudices to fill a hard drive. But acknowledging the problem sheds some light on why IT is often *not* aligned. How do you get in-step with the business side if you don't even know what's going on where?

LEVEL 2 Prioritize the projects in your database. Last year, Laurie Gaines amassed her IT projects in a central repository for Brinker International, the Dallas-based company that builds restaurant chains such as Chili's, On the Border and Macaroni Grill. Immediately, projects looked less like discrete efforts and more like an interdependent suite. The relational view suggested to Gaines, Brinker's vice president of IT, that prioritizing the projects using a simple risk-return analysis would enhance IT even more in the eyes of execu-

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tives. Such a quantifiable ranking would, basically, give executives latitude and longitude readings on the IT department's "map." It would make IT navigable.

Of course, ranking projects is not a science, and project portfolio management doesn't necessarily make it any easier. "Suddenly we're having these incredible debates," Balliet says. "Is disaster recovery strategic or not? If [businesspeople] say they have a

45 percent strategic spend, what does that include?" But just going through the exercise gets IT and the business talking.

Before portfolio management, project priority in IT often meant pitting one *against* the other: "ERP is more important to our business than CRM." With a portfolio, it's each in terms of relevance to the business: "ERP carries a 20 percent risk with a 60 percent payoff, while CRM carries an 80 per-

cent risk with a 90 percent payoff." That kind of understanding forces alignment and gives IT a more strategic role.

"My accountability is higher now, but my role is higher. The impact of the projects is much higher, and my staff feels much more in touch with what's going on in the business," Gaines says.

Using tools businesspeople understand can also help (some CIOs are even producing "IT annual reports"—see www.cio.com/printlinks for more). To prioritize Brinker's IT projects, Gaines, for example, has started to use the same risk management tools her company uses to evaluate physical sites for building restaurants, including hurdle rates and payback calculations. The bosses trust and understand those tools, so Gaines avoids any problems of translation from IT-speak to business-speak.

LEVEL 3 Divide your projects into two or three budgets based on the type of investment. Balliet may admit to lacking an overview of his IT spending before he moved to portfolio management at Merrill Lynch, but he's developed a deft touch since then. "When I started this, about 21 percent of costs were aligned with the business. Now we're at 78 percent aligned," he says. "Because of the portfolio, we're able to fund strategic investments in a severe downturn for the first time ever" in Merrill Lynch's 116-year history.

Balliet's portfolio is split into three different budgets: utilities, or what he calls the "keep the lights on" portion; incremental upgrades; and strategic investments. What he found is that far too much of the budget is allocated to the utilities function on the left, while far too little is given to strategic investment on the right. If the budget spectrum were a toothpaste tube, Balliet's main objective now is to squeeze as much toothpaste as he can from the left side to the right.

The goal is to get more for the same amount of money, says Joseph Castellano, CIO for New York City-based Verizon, who divides his budget into operations and strate-



*An automated portfolio lets Verizon CIO **Joseph Castellano** spend less time maintaining it and more time making critical decisions.*



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DOESN'T MEAN IT SHOULDN'T BE PLUGGED IN.

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gic investments. Castellano benchmarks his operations budget against Verizon's past and against the industry. He measures cost of IT as a percentage of revenue. He measures costs per line of code and cost per employee. Castellano twists and gnashes that operations budget, because he knows every dime he can wrest from it will drop into his strategic one.

LEVEL 4 Automate the repository. The portfolio metaphor is strong, but not infallible. It wilts a bit when you get to Level 4. A portfolio is a collection of documents, a suite. It implies something static. It sounds like it might collect dust. But in IT, portfolio management becomes an ongoing way of life. Castellano calls his portfolio "living...organic."

That's largely because Castellano has automated it and spends a good amount of time rejiggering the projects in it. While project priority for the year is initially set in the fall, the technical automation, which Verizon did internally, allows new projects to be added to the portfolio at any time. A man-

taken away. If money is reallocated, that information is immediately entered into the portfolio; budget changes are reflected as soon as they occur.

The part that is not automated is the decision making, which Castellano says takes place in intense, face-to-face sessions with the business leaders. But automating the portfolio gives Castellano more time to spend making those tough decisions. And that's the clear advantage of automation: Less time needs to be spent managing the portfolio so more time can be spent interpreting and reevaluating it.

LEVEL 5 Apply Modern Portfolio Theory to IT. Who's using Markowitz's Modern Portfolio Theory in IT? Not many. While it's certainly a noble endgame, it is arduous and will require a total transformation of how IT operates.

Modern Portfolio Theory is set apart by the specific math it employs—including risk-return tools that map project risk on a curve—and the ways it dictates one should

Before portfolio management, project priority in IT often meant pitting one against the other. With a portfolio, it's each in terms of relevance to the business.

ager enters a project into the database by answering several questions onscreen, such as What's the project? What technologies are involved? What's the estimated budget?

The questionnaire uses the answers to build a project portfolio entry automatically. Once it's done, the project is stacked against others already in the portfolio. Castellano meets quarterly with all of the business managers to look at the portfolio to see if he can reprice or reprioritize projects. If he wants to bump up a certain project's priority, it automatically gets more funds, while others moving down the ladder will have funds

manage once some quantifiable risk is established. At Schlumberger, this was Walton's vision to start, and to some extent, it remains her goal. But she has learned that there's a danger in stumping for the total vision. "I've found people will cite Markowitz as a reason *not* to use portfolio management in IT," Walton says. "They'll argue it can't be overlaid exactly and that the math is too difficult. So to some extent, I don't talk about pure portfolio theory to executives." (If you'd like to see how Modern Portfolio Theory really works, try the MPT Wizard at www.modporttheory.com.)

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For more on **I.T. VALUE**, including links to other stories and a look at the IT annual report, visit www.cio.com/printlinks.

Douglas Hubbard, president of consultancy Hubbard Decision Research in Glen Ellyn, Ill., is a strict interpreter of portfolio management who would like to limit its definition to, at most, Levels 4 and 5 of our scale. When he applies portfolio management to IT, he includes many Markowitz-like practices. While the approach may sound prohibitively dense, Hubbard argues it's not. Because the tools are all there—they've existed longer than IT has.

"Is it more complex than the way IT operates today? Yes," Hubbard admits. "But it's the right way. The cancellation rate of the largest IT projects *exceeds* the default rate on the worst junk bonds. And the worst junk bonds have lots of [portfolio management tools] applied to them. IT investments are huge, risky investments. It's time we do this."

POSTSCRIPT: I.T. IS NOT SPECIAL

In a sense, the CIO who takes on project portfolio management is admitting that the jig is up. IT will no longer be different, or special. It will operate like any other part of the business. The CIO can use the same tools as the CFO and have the same accountability as a senior sales executive. The reward for the CIO is clear: a more central and crucial role in the business.

"It has brought normal business disciplines to IT," Verizon's Castellano says. "People trust us. We're not our own little secret area. We're totally accountable for what we do and that's a good thing."

"It's true, IT is not special," Vantucci says. "That's not only OK, that's great!" **CIO**

What value techniques help you relate to your business colleagues? Tell CIO's IT Value Editor Katherine Noyes at knoyes@cio.com. Senior Writer Scott Berinato can be reached at sberinato@cio.com.



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Back from dotcom land:
(top, from left) Utah CIO **Phillip Windley**;
John Hnanicek, president at Paciolan;
(middle, from left) **Scott Dinsdale**,
digital strategist for the Motion Picture
Association of America; **John Puckett**,
VP of business development at Polaroid;
(bottom) **Bob Whyte**, CIO at SAP Portals.



BOB WHYTE

DOTCOM CREDENTIALS

CTO, PayMyBills.com; COO, TimeBuy.com

BEFORE THE STARTUP

CIO at DirectTV; CIO, Disney
Imagineering

NOW

Senior VP of operations and CIO,
SAP Portals

WHAT HE MISSES ABOUT STARTUP LIFE

Celebrating the daily victories

YOU CAN GO HOME AGAIN

After taking the dotcom plunge, CIOs returning to traditional corporate life invigorate their new companies with the skills they picked up at the front **BY STEWART L. DECK**

Bob Whyte did the dotcom dance—not once, but twice. In 1999, he left his solid CIO job at DirectTV for the chief technology officer spot at PayMyBills.com, an online bill-paying service for consumers, whose business model caught his imagination. He jumped just eight months later to land as chief operating officer for TimeBuy.com, a service for media advertising buyers. Then came a disagreement with the chairman on company direction. Whyte resigned. (The company eventually went belly-up.)

It was November 2000. And after a tumultuous year-plus as a dotcom executive, Whyte wasn't looking for more startup scintillation. "The end of that [period] was like a death. All of the stages, from denial through anger to acceptance, applied," says Whyte, now 42. "I knew after what I'd been through personally and what it put my wife through, I didn't want to go that direction again for a while."

That direction, as returnees from the Internet startup front have seen, wasn't always fun and certainly wasn't a clear path to glory. But it also wasn't a bust. Whyte, along with four other prodigal CIOs profiled here, brought back business insights and management strategies that

Reader ROI

- ▶ See what former dotcom CIOs bring back to traditional companies
- ▶ Understand why traditional companies are looking for startup skills
- ▶ Learn how a dotcom experience can change a CIO

they learned during their dotcom days to the terra firma of corporate America and state government.

For Whyte, the homecoming meant three months of job hunting before signing on as CIO and senior vice president of operations at SAP Portals, a subsidiary of ERP vendor SAP AG. He brought his recent past with him; he demanded to report to his division's CEO and to be included in strategy discussions. To accelerate action-taking, he says he empowers his staff to make decisions so that his IT managers, for example, don't have to get his sign-offs for purchases.

Whyte and other CIOs returning to traditional businesses found that the ground had shifted. "When I left, I assumed startups were the only ventures that could adopt new, cutting-edge ideas," Whyte says. "But in the time I was out, the Global 1000 realized that *they* would need to change. Projects get going faster and move much more quickly than they did three years ago."

Here's what four other CIOs found on their journeys back from dotcom adventures.

THERE'S PLENTY OF E-BUSINESS TO DO IN THE OLD ESTABLISHMENT

For Phillip Windley, the transition from the Internet world to government appointee was counterintuitive. Compared with serving as CIO for the state of Utah, he says his last two jobs were buttoned-down portraits of stability, albeit fast-paced. It is state government that he finds full of possibilities.

Windley was vice president of product development for Excite@Home's (At Home Corp.) e-business applications group, where he directed 125 engineers, product managers and operations folks who built the broad-

band provider's payment gateways, e-commerce systems, online cash registers and shopping carts. Before that, he served as CTO at iMall, an online shopping destination, which Excite@Home acquired in mid-2000. Those roles put him in a comfortable position. "I knew what we were going to do every day," Windley says. "Government is a totally different thing. You deal with [state]

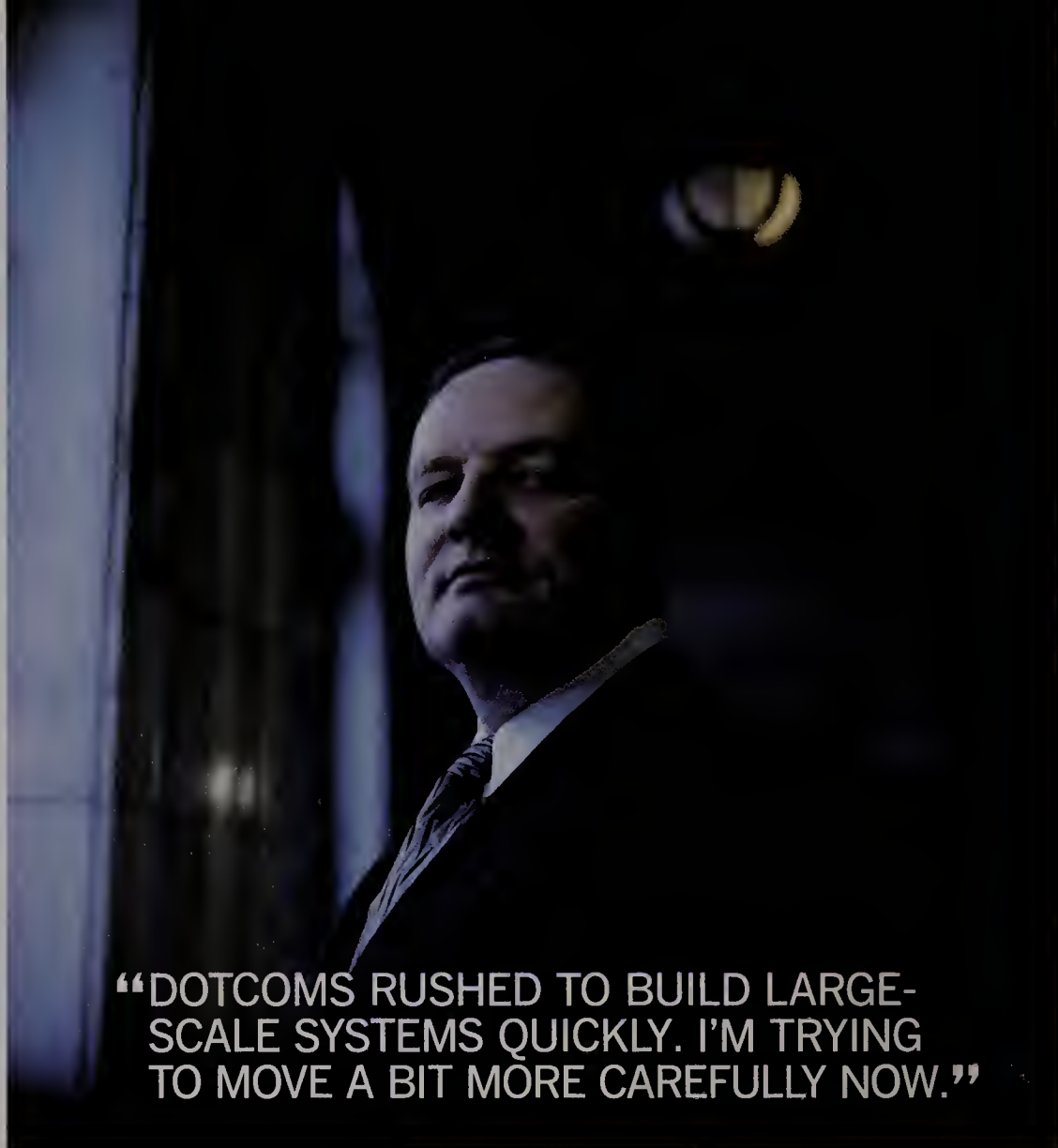
agencies and the legislature and putting together plans for [a new set of online government services]. It brings up new ideas and new challenges almost every day."

Windley, 43, serves as Gov. Mike Leavitt's lead IT executive for a \$7 billion state bureaucracy that has 20,000 employees, approximately 250 offices and more than 25 agencies. Windley and his team are working on organizing a central framework—essentially an ASP for state agencies—that agencies can use to bring their services online, from driver's license renewals to food stamp applications.

This framework, to be managed from one central location, calls for security provisions and the ability to conduct transactions.

If that sounds like e-commerce, then it shouldn't be surprising to hear Windley talk about applying lessons from his time at Internet startups. First, product management: The e-government initiative calls for the same kinds of marketing, sales, pricing and customer service functions as his work at Excite@Home. Second comes the quick delivery, modified for state government needs. "A lot of dotcoms rushed to build large-scale systems quickly that could handle 100,000 users before they even had 1,000," he says. "I'm trying to move a bit more carefully now by building smaller prototypes to learn where we need to go and then moving with some deliberation."

Leavitt says he was specifically looking for someone with a startup background and entrepreneurial attitude to fill the state CIO post. Leavitt recalls a presentation Windley made to the Utah state cabinet just weeks after he started. "He described how a clearly defined



"DOTCOMS RUSHED TO BUILD LARGE-SCALE SYSTEMS QUICKLY. I'M TRYING TO MOVE A BIT MORE CAREFULLY NOW."

PHILLIP WINDLEY

DOTCOM CREDENTIALS

VP of product development, Excite@Home; CTO, iMall.com

BEFORE THE STARTUP

Professor of computer science, Brigham Young University

NOW

CIO, state of Utah

WHAT HE MISSES ABOUT STARTUP LIFE

Giant monthly barbecues

WANTED: CIOs WITH DOTCOM CHOPS

A brief list of traits CEOs say they like seeing in executive candidates formerly with dotcoms

- The ability to take decisive action
- Emerging technology expertise
- A lead-by-example entrepreneurial drive
- A power-sharing management style
- The drive to set up cross-functional teams for e-commerce projects

STRATEGIC DIRECTIONS

THE CHALLENGE OF Wireless



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What do you have to say?

THE CHALLENGE OF Wireless

The potential of broadband wireless is bold enough to get even the most jaded IT people excited: instant transparent backups, upgrades and e-mail updates. Wireless means never having to find an available port or telephone jack to plug into.

As CIOs dream of wireless capabilities for tomorrow, they are creating implementation headaches for their IT staffs today. The mere act of trying to manage an elaborate wireless operation is enough to drive any wired LAN guru to tears, as we discover in "Managing Users, Not Devices" on Page 4.

And to keep those wireless dreams alive, networks must deliver the speeds that not only match today's wired throughput but far exceed them. It's safe to assume that when the apocryphal Jack was being nimble and quick, he was likely not trying to wrestle wireless packets at the time. As we find out, promised wireless speeds are often just that: promised. Fear not, though, our report on Page 8 also tells of hope on the horizon.

But that hope comes with price tags. New products, applications and services are springing up all over. On Page 12, we talk about the coming together of many devices. Are merged devices the answer? Our story looks at the pros and cons of

this new product category and offers some hints on making the necessary pioneering technology choices.

One of the tactical advantages that the dotcom startups—may they rest in peace—had for the past few years was the absolute absence of legacy systems. Starting with a clean slate, a startup could purchase the exact right equipment for its needs and not have to worry about integrating with existing technology. Few CIOs today have that luxury.

As though wireless operations aren't challenging enough, technology staffs must integrate them with wired networks that were designed by people who gave little serious thought to

wireless communications. We spoke with many users, systems integrators and others to explore the easiest and safest ways of bringing wireless capabilities into an existing network. Read our findings on Page 14.

Our report also includes close-ups on the wireless efforts of Sears, Roebuck and Co. and TRIAC Industries, two players that opted for very different—but equally successful—approaches.

The potential for wireless is vast and, by leveraging a few of the lessons the earliest pioneers learned, the rewards are worth the effort. **SD**



Inside this issue:

4 Managing Users, Not Devices

From a management perspective, a wired network is a thing of beauty and simplicity. Wireless networks, on the other hand, offer a very different set of issues.

8 All the Necessary Wireless Speed

For those accustomed to surfing the Internet at megabit speeds, today's second-generation wireless networks are like trying to swim in molasses. Third-generation, though, could let wireless leapfrog the speeds of today's desktop services.

12 Here Come the Smartphones

Earlier this year, Fred Hann handed each of the 14 salespeople at Recovered Capital Corp. in Columbus, Ohio, two devices to carry with them at all times—a Web-enabled cell phone and a Handspring Visor. Hann, chief auditing officer at the company, then discovered that there are more differences between wired and wireless than a mere cable.

14 The Integration Dilemma

An international provider of mobile data-management systems and services provided its salesforce with PDAs and wireless access to a back-office ERP system. The trick was getting a mostly wired network to accept the wireless input.

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Managing Users, Not Devices

**Wireless devices require a change
in management philosophy—and tactics.**

The wireless revolution is coming, and if IT directors are honest, they'll say they don't like it one bit.

From a management perspective, a wired network is a thing of beauty and simplicity—it can be centrally managed using Simple Network Management Protocol (SNMP) and a wide range of tested PC management tools. Wireless networks, on the other hand, don't provide the same kind of tried-and-true end-to-end management.

An Internet backbone, for instance, doesn't allow SNMP data, only messages. This raises perplexing management questions, as more IT directors are being called on to integrate an unruly bunch of wireless devices—from cell phones to laptops to

point-of-sale terminals—into their companies' existing networks.

For instance, how do IT directors know if their companies' salesforces have the most current applications? How do they troubleshoot road warriors' laptops? How are user changes, which might affect the system configuration, discovered? How is the backup of key files ensured? How can IT directors be responsive to problems without getting a view of the mobile system? And, most of all, should they even bother trying to manage these devices?

The answer to that last question is clearly yes—because they will be forced to.

"A lot of users will buy a [RIM] Blackberry pager and then expect the IT manager not only to support it, but to

install several thousand dollars of [Microsoft] Exchange software so that they can get e-mail on it," says Eddie Hold, director of telecom services for Current Analysis, a consultancy in Sterling, Va. "This is a big headache for IT managers who are not anticipating the demand and are getting a lot of pressure from the ground level to support mobile products."

Wireless network management is getting better every day, though, with additional improved tools being introduced. Indeed, wireless networks are coming closer to the level of capabilities of their wired counterparts.

In the meantime, early wireless implementations will have to support the wide range of wireless devices that are performing so much mission-critical work. Salespeople, truck drivers, customer service reps and field service technicians increasingly need near real-time access to corporate data while on the road. Doctors are inputting critical patient information at bedsides. Delivery personnel are entering package information into wireless devices, providing better tracking. Business professionals are using wireless messaging devices such as Blackberry pagers to retrieve e-mail while they travel.

The proliferation of mission-critical applications to laptop computers requires IT departments to provide mobile and remote management beyond typical LAN-based offerings, says Stephen Drake, an analyst with IDC. And this requires IT management to adopt new tactics and new management philosophies to meet the demands of the fast-approaching wireless revolution.

Sears: Doing Repairs the Wireless Way

Leveraging ruggedized handheld PCs, satellite networks and secure, remote mobile links into its network, Sears, Roebuck and Co. has been able to transform the way it performs customer repair visits. In the past, Sears product repair technicians who serviced appliances in consumers' homes invariably would need to use the customers' telephones to communicate with dispatch. Sometimes, an even-less convenient payphone was used. Once technicians were on the road, it was difficult to contact them to cancel service calls, reroute vans, check inventory or close out jobs. Often, technicians arrived at service calls to find no one home or that they didn't have the right part.

But an alliance between Sears Product Repair Services business and Cingular Interactive, a business unit of Cingular Wireless, that began in 1994 changed all that. Today's Sears repair technicians use wireless technology that interacts with orbiting satellites. This new solution builds on the 1994 land-based wireless partnership that helped improve operations but left some territories uncovered and unreachable.

The Cingular system means that field technicians can wirelessly access customer account information, project arrival times and provide job estimates. The ability to enter data directly into Sears' network eliminates the need for data entry at branch offices.

For more information about Cingular, visit www.cingular.com.

Managing users, not devices

The management issues derive from the limitations of wireless: It is a slow, high-latency and not-always-available network that connects to a vast array of smaller devices with limited user interfaces. Mobile devices can range from smart-phones to interactive pagers to Palm and PocketPC systems. The variety of operating systems makes it difficult to keep track of configurations and users, as well as to know what devices will support new applications. Devices also vary in terms of battery life, screen size, memory and hard-drive capacity.

"With these devices, the management tools you are used to in the PC world don't work nearly as well," says Craig J. Mathias, principal of Farpoint Group, a consultancy in Ashland, Mass. "In most cases in the wireless world, you don't manage the device anymore, you manage the user of the device."

From an IT director's point of view, wireless is a lesson in compartmentalization: Certain information must be made available to certain classes of users over certain devices. Turning these "certains" into specific technology choices requires, first, a firm understanding of what data need to be distributed to whom and under what circumstances. Then that data must be structured so that only the relevant information is provided and looks intelligible on a small screen.

Wayne Fleming, professional services manager for Optimus Solutions, an IT consultancy in Norcross, Ga., looks for ways to ease wireless transmissions for some 30 employees who connect via palm-tops and cell phones to the network to access e-mail and IBM's Lotus Domino-based applications. The sales staff's devices have several "canned" replies in the subject and body of the e-mail, such as "I'm on the road, will call you in an hour" or, "Will get on this as soon as I get back into the office, responding on a mobile device."

All mobile devices involve compromise. Experts say an IT director should look to minimize the number of devices in the company and maximize the utility of those tools. Mathias, for instance, suggests a

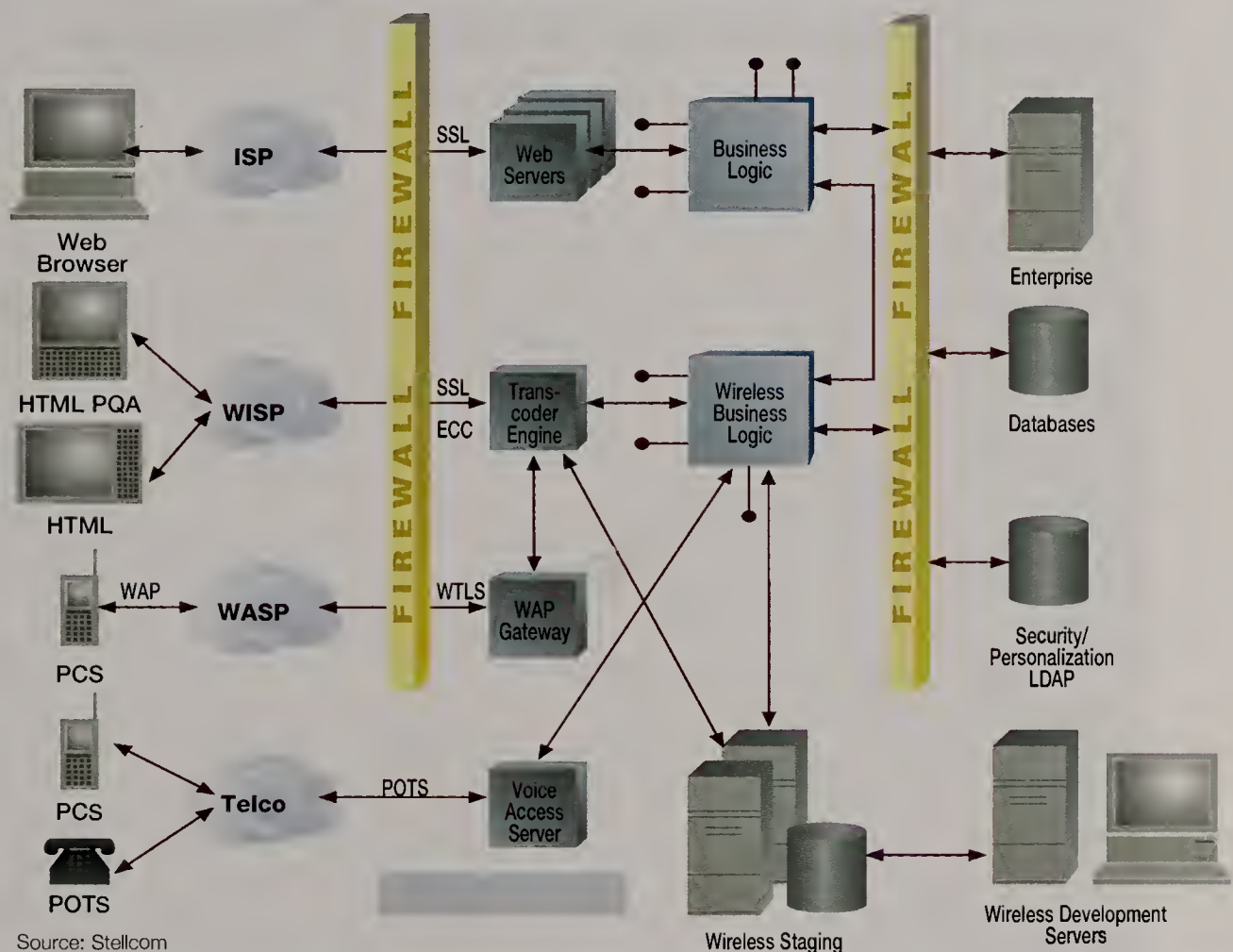
company localize on a small number of devices, rather than on exclusive devices. This might increase support costs, but training costs typically will go down because certain people intuitively grasp certain devices better.

"If you are deploying a device to 20,000

many requests get dropped altogether and are never answered."

Unlike desktop operations, support can't be an afterthought with mobile devices. IT directors need to be more involved in planning support at the same time the application is developed. Field

Simplicity: thy name 'tis not wireless



As LAN administrators are quickly learning, the complexity of a typical wired LAN is easily dwarfed by its wireless cousin.

people, you can afford to spend some bucks in training," Mathias says. "If you're going to have only 50 mobile users, it makes more sense to say, 'here are four different cell phones, choose one.'"

Develop support with apps

To ensure future manageability, wireless projects require much greater attention to the pilot stage than most IT projects. "With most pilots, you just get the application running and let it go," Mathias says. "With wireless, you need a greater level of documentation. You need to know how much data are being moved, how long it takes people to respond to the data, how often they are out of range and how

personnel, almost by definition, will use the wireless device to interact with customers and potential customers.

"If a field person is in front of the client, the support process might be how to have them complete the sale without the device rather than to troubleshoot the device right there," says Martin Dunsby, a partner with Deloitte Consulting in Atlanta. "You can't force wireless support into the same model as desktop support, because there are more failure points, more devices and more time criticality."

Most handheld devices are not really managed in the sense that a laptop computer is, Mathias says. Take security. In the future, handheld devices and even cell

phones could contain critical corporate information. Security steps can be taken, such as password-protecting handheld devices, but analysts and IT directors concede users will likely ignore such tasks.

Instead, the key is user education. To limit the chance of denial of service, for

IT departments must take into consideration decisions made for today's wired environment that may have implications for wireless users in the very near future. One example is VPNs. Most VPNs are designed for broadband Internet access and don't take into account the lower band-

"You can't force wireless support into the same model as desktop support, because there are more failure points, more devices and more time criticality."

instance, end users need to be educated about how downloaded, unsupported shareware on a palmtop could disrupt the configuration settings.

VPN and department conflicts

Wireless deployment can bring up unexpected conflicts with other departments. In many companies, for instance, voice telephone services are not handled by the IT department. This doesn't create problems now for remote users dialing into the network through a Virtual Private Network (VPN) or Remote-Access Server (RAS). But with the advent of Bluetooth, a new technology that will allow devices in the same room to communicate with each other, and third-generation (3G) wireless, IT departments have to be careful that the telephone side isn't inking deals with telephone providers that won't be ready for the coming wireless data revolution.

"What if the voice department says that all the cellular phones the company is using will be on [a particular carrier] and it turns out [that carrier] won't offer data services for years?" asks Barney Dewey, an analyst with the Andrew Seybold Group LLC, a consultancy in Los Gatos, Calif. "If the IT department wants to provide data connections to users, they'll want to go with someone that supports data speeds starting at 153Kpbs, and during the next two or three years will move up to more than 2Mbps. People don't realize that there will be a huge gap between what different carriers will be able to provide as far as data access." Some carriers will offer more than 150Kbps services, others 20 to 30Kbps and some no data service at all."

width networks, such as the Palm VII.

"You don't want a completely separate management system to serve one person dialing into the VPN through a laptop on a hotel broadband connection and another for the users in the field on a Palm VII," Dewey says. "There is no sense in putting in a VPN now and having to turn around in a year and say, 'Now, what do I do about all the people who want wireless access?'"

Dewey suggests choosing a VPN that provides good wireless support or that can seamlessly provide such capacity through a third-party module.

Set expectations

Setting expectations is a crucial part in managing wireless users.

Carnegie Mellon University, the leading science school in Pittsburgh, is a wireless pioneer. Beginning in 1994, Carnegie Mellon developed a wireless LAN that now covers 3 million square feet of campus and serves 3,000 users who have everything from laptops and handheld devices to more esoteric equipment like robots and wearable computers.

The wireless LAN is up to the 802.11b standard, providing up to 11Mbps of throughput through most of the campus, with 2Mbps as a fallback in some areas. A wireless LAN provides several management challenges, particularly when compared with a wired LAN.

"With a wireless LAN, I may still use SNMP to provide some information, but the information is limited," says Chuck Bartel, director of operations for computing services at Carnegie Mellon. "I may be able to find out if an access point is up or

down, but not know if that's because the radio card is not functioning properly or because someone has removed the card."

Wireless LAN users have to be cautioned against "antisocial" uses, such as streaming media and backing up their machines over the wireless network, since this can gobble up bandwidth that is shared by other users. For the most part, though, people can do anything over the wireless LAN that they can do from their office computers connected to the wired LAN.

Early on in the project, Carnegie Mellon worked with what is now Verizon Wireless to extend coverage off campus through the Cellular Digital Packet Data (CDPD) protocol. "We've backed away from this, because once people are used to 2Mbps coverage, having to cut back to 9.6 to 19.2Kbps service leaves a lot to be desired," Bartel says. "You have to have some expectation setting if they are used to the higher speeds of the wireless LAN on campus. They'll have limited Web browsing and limited e-mail, and that's about it."

Remember back-office

Roman Hlutkowsky, director of operations technology for FedEx Ground in Pittsburgh, points out that development and deployment is the tip of the iceberg in wireless projects. "As you deploy systems to field operations, you have to take into account how to monitor and report, and how to do the escalation processes," he says. "Those are mainstream IT functions, but for some reason, they often get overlooked when dealing with field operations. IT departments focus all of their attention on the benefits of automating field operations, but they forget classic back-office support requirements. Deployment and development are not the be-all and end-all—you still need the ability to do wireless management and ping the devices."

FedEx recently rolled out a new \$80 million data-collection system, which includes new on-van computers; enhanced handheld scanners for electronically capturing delivery information, including signatures; wireless LANs at every FedEx Ground facility; and wearable ring scanners.

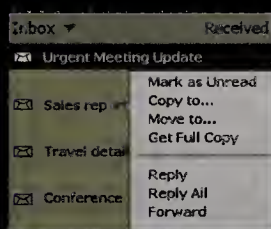
The pickup and delivery vans are

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equipped with new in-vehicle computers that constantly transmit delivery data captured by STAR II scanners developed by Salt Lake City-based Symbol Technologies to the company's central mainframe computer. Data is uploaded at every delivery stop over BellSouth Intelligent Wireless NetworkSM, a nationwide packet-radio WAN. In rural delivery areas, satellite communications are used.

The distinctions between wired and wireless are clear. But there are major implementation differences even from one wireless network to another. Security and interference, for example, require unique approaches, depending on whether the network is a wireless LAN or a wireless WAN.

"Wireless LANs are mobile networks that use the 802.11b standard and utilize the 2.4GHz frequency, a frequency that is overcrowded. These factors make wireless LANs much more vulnerable to security breaches and interference problems," says Rita Khayat-Toubia, the CIO of Western Multiplex. "In contrast, wireless WANs are fixed networks that use the IEEE 802.3 standard and proprietary security schemes. Wireless WANs can also use other frequencies, including 5.8 and 5.3GHz and those are frequencies that are much less crowded. All of these factors make wireless WANs much more secure and less vulnerable to interference."

In some wireless systems, handheld devices use an embedded wide-area modem. In FedEx's system, the delivery personnel's handheld device connects to an in-vehicle system, which buffers the information and provides an additional point of redundancy. This allows data transmission to be isolated from data collection. "If I have network problems, my in-vehicle computer will worry about retry logic to get messages transferred back and forth, and my contractor can still perform pickup and delivery work," Hlutekowsky says.

The biggest challenge in managing wireless devices, from Hlutekowsky's viewpoint, is training and communication. "We want our people to focus on their jobs, not on learning a piece of technology." **SD**

All the Necessary Wireless Speed

Although the speeds of second-generation, 2.5G and 3G wireless are intriguing, it's user beware—or at least be aware—of the technology.

For those accustomed to surfing the Internet at megabit speeds, today's second-generation (2G) wireless networks are like trying to swim in molasses. Third-generation (3G), though, could let wireless leapfrog the speeds of today's desktop services.

Roughly, 2G technologies perform at about 9 to 10Kbps, although 2G technically can go as fast as 14.4Kbps. The next step up—2.5G—is rated for 65 to 144Kbps, and 3G promises about 150Kbps.

It won't be easy to achieve the speeds promised by the 3G networks. Various standards and regulatory issues are standing in the way—along with the usual stumbling blocks associated with a new technology, such as the expense of updating existing infrastructure and the challenge of picking the "right" gear. Carriers and equipment vendors have been promising that 3G is just around the corner. The reality is that there's still a long road ahead.

But it should be worth the wait. Not only could 3G wireless finally bring desktop applications to handheld devices, but that kind of speed opens the door for new mobile commerce business applications.

It could—dare we say—change the way companies do business.

G—whiz!

A quick review of rule number one regarding data rates: The figures are too high. This rule is especially true when looking at wireless speeds.

"With wireless, you don't know what the performance is going to be at a given moment," says Craig J. Mathias, principal of Farpoint Group, a consultancy in Ashland, Mass. "The speeds you see

quoted are the speeds that the marketing departments of the carriers guarantee they will never exceed."

Factors including communications protocol overheads and distance from base stations can affect wireless speeds. On the ground, speeds tend to be one-third to one-half of the technology's official rating.

The two leading 2G network tech-

What's the problem?

Some reasons why real-world data rates don't match specifications

- Distance from base station
- Interference from other electrical equipment
- Communication protocol overhead
- Speed of equipment with which user is communicating
- Power fluctuations/low battery

nologies are the Global System for Mobile Communications (GSM) and Code Division Multiple Access (CDMA). The chief difference between these technologies is that while GSM assigns a specific frequency to each user, every CDMA user—in theory—has access to the entire available spectrum. "A 2G network is a voice network, with data as an afterthought," Mathias says.

That the industry is being cautious is well illustrated by the fact that the next step after 2G isn't 3G, but 2.5G. "2.5G is that first step to 3G," says Lars Nilsson, manager, strategic marketing for Ericsson, in Plain Oak, Texas. "Even if you don't get the very high data speeds."

The introduction of packet switching is that big step to what previously had been a circuit-switched environment. What this means is a more efficient and more easily tuned network that is optimized for data. That's a good



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thing, since wireless data users in North America alone will grow from last year's 7.3 million to more than 137 million in 2005, according to numbers from researcher Gartner/Dataquest, headquartered in Stamford, Conn.

Although the technology for 3G is in place, the industry is still in the pilot phase. According to industry expected numbers, 3G should provide speeds of around 150Kbps. Of course, that speed needs to be taken with the usual disclaimers—actual speeds should reach between 20 and 60Kbps, at least in this initial iteration.

Ericsson's Nilsson says users can expect to see 3G "by the end of the year. Initially, it will be in [geographic] pockets, but these will grow over time."

G forces

Several barriers are slowing the implementation of 3G solutions, beginning with the fact that there is more than one network that can legitimately claim to be third generation. The term 3G, after all, only defines performance, not how that performance is achieved.

"There are two basic road maps to 3G," says Daniel Miller, senior vice president of

Systems, in Owings Mills, Md. "Then we found that we could make money by auctioning off the spectrum. Now it's seen as a way of generating money for the government." The FCC is in charge of doling out the spectrum, subject to the approval

The usual suspects

Potential target cities for initial 3G rollouts in the United States

- Washington, DC
- Chicago
- New York
- Dallas/Fort Worth
- San Francisco
- Los Angeles

and oversight of the U.S. Congress.

Carriers insist that more spectrum is needed to handle the anticipated growth in demand. But there's a lot of resistance, especially from the Department of Defense, which already uses some of the frequencies that carriers are eyeing. "It's kind of hard to argue with national defense," one analyst observes.

"The suggestion of insufficient spectrum being available isn't as significant as the carriers might be leading the authori-

Carriers will have to decide how much bandwidth to dedicate to voice versus data. "It'll be largely up to the carriers as to what they want to offer," Mathias says.

It would be naive to expect an emphasis on data from the carriers: The bread-and-butter of these companies has been voice, "and they don't want to jeopardize the voice network," Aether's Davis says. "If they see an imbalance, they'll say 'let's slow down'" the emphasis on data.

"There's a legacy of old networking protocols that will survive and will have to be accommodated," Kelsey's Miller says. "There has to be an emphasis on the lowest common denominator if you are going to offer equipment that's up all the time. They will have to rebuild the entire infrastructure—new radios and new base stations. That's the real threshold we have to cross."

"The gating factor is the wireless network infrastructure," agrees Jerry Jalaba, vice president, enterprise, for Palm, in Santa Clara, Calif. "Essentially, you go through an evolution—constantly upgrading from one to the next." Even after the technology is announced in a given country, it will be some time before it's available everywhere in that country.

Getting all the different technologies and subsystems to work together can be a challenge. "The biggest stumbling block, I hear, is that there's a fair amount of complexity to deal with...multiple carriers, different technologies...IS organizations will have to struggle with that," Jalaba says. "ISPs will have to work on a simple way to extend their offerings."

All the talk about 3G is having one effect: buzz.

Many users seem content to wait patiently. Office Depot, for example, only finished rolling out handheld devices to its 22,000 delivery trucks in the second quarter of 2001. The company has managed to make its deliveries "virtually paperless," says Dennis Andruskiewicz, senior vice president of distribution, business services group, in Del Rey Beach, Fla.

Faster speeds could let the company validate credit cards and capture and store signatures. But while Andruskiewicz shows

It would be naive to expect an emphasis on data from the carriers: The bread-and-butter of these companies has been voice, "and they don't want to jeopardize the voice network."

the Kelsey Group, a market research company in Princeton, N.J. "One based on CDMA and the other on GSM." CDMA will evolve into W (wide) CDMA, while GSM networks will adopt the General Packet Radio Standard (GPRS).

Exactly how the wider bandwidths will be transmitted is another subject of concern, especially in the United States. "In the U.S., we originally looked at the situation as 'managing the spectrum' so it wouldn't all be used up at once," says Curtis Davis, corporate vice president for wireless technology provider Aether

ties to believe," says Phil Marshall, senior analyst at the Yankee Group in Boston. "I think they have more than enough spectrum for their purposes."

"CDMA carriers, at least, could get by with current bandwidth on the low end of 3G," agrees Farpoint's Mathias. "But more bandwidth is always better."

Technically speaking

From the technology perspective, implementing 3G offers some unique challenges, not the least of which is determining how to allocate the expanded bandwidth.

some interest in such capabilities, the company does not yet have plans in that area.

Other users are more eager for 3G to become available. The Sheriff's Department in Lake County, Fla., uses mobile and wireless devices (primarily ruggedized Palms) to do everything from disseminate pictures of missing children to run quick checks on license plates of traffic violators, according to Sheriff George E. Knupp Jr.

Knupp says his organization will switch to 2.5G as soon as it becomes available and to 3G quickly, as well. "Speed is very important," he says. "You never know who you are dealing with. An individual may look like a professional businessman, but may in fact be the biggest dope dealer in the state of Florida." Faster information flow means a faster—and safer—Sheriff's Department, and the wider bandwidth will also allow more simultaneous users.

Better, stronger, faster

Once 3G is in place, then what?

3G speeds will enable companies to speed up the work users already do on their handheld devices. It will also introduce a whole raft of new capabilities.

First, speeding up existing applications: Among other things, users will have access to a fully functional wireless Internet as well as the corporate intranet.

Says Palm's Jabala: "The way applications are developed today, the core parts are transmitted by wire and updates are done wirelessly. As the speeds of the wireless networks begin to increase, there's the greater capacity to move data wirelessly and make the whole synchronization process transparent, and do it in the background."

Simple communications chores will be enhanced, too. "Downloading e-mail is excruciating at this speed," Kelsey's Miller says. "With 2.5G we are moving to a totally packet environment, and more devices will have always-on connectivity. I can have a multimodal experience with voice and text user interfaces and toggle between them seamlessly."

Providing wireless users with the same information available in a wired Internet

environment will prove to have some real business benefits. "Today, I can't get a whole customer record, I have to choose what I need," Aether's Davis says. "With high speed, salespeople will be able to access fully updated inventory figures

A sample of 3G pilot projects

Vendor: Lucent Technologies, Qualcomm
Location: United States
Technology: CDMA2000
Type of Project: Technology Test
Timeframe: Late 2000

Vendor: DoCoMo
Location: Japan
Technology: 3G
Type of Project: Trial Launch
Timeframe: Spring 2001

Vendor: British Telecom
Location: United Kingdom
Technology: 3G
Type of Project: Trial Launch
Timeframe: Summer 2001*
 *Project was scheduled to launch 5/01, but equipment problems delayed it.

Vendor: Cingular Wireless
Location: United States
Technology: 2.5G
Type of Project: Pilot Launch in Limited Areas
Timeframe: Scheduled for fall 2001

Vendor: Vodafone
Location: United Kingdom
Technology: 3G
Type of Project: Technology Test/Trial Launch
Timeframe: Spring 2001

while standing next to a client."

Access to all sorts of records will become available. Medical patients can have remote monitors that provide full medical histories and alerts. Maintenance crews can have instant access to an inventory of parts and—more significantly—to

online repair manuals.

The field of new applications is wide open, including applications now available only on the desktop and applications that would only make sense for mobile users.

"3G means good quality streaming audio," Farpaint's Mathias says. Although businesses may not care whether mobile users can listen to high-quality music on the road, carriers figure it may well be a profit center for them.

A related option in the works is interactive video. By mounting a camera on a handheld device, 3G can provide the bandwidth for mobile video conferencing. "Right now, there's no device with the battery power and bandwidth to let you watch a TV show on your Palm. I think it remains to be seen if 3G will allow that," says Michael Grenier, director, business development for Firepad, a Mountain View, Calif.-based enterprise mobile solutions developer.

It is also unclear whether there's much demand for the video telephone. "The video telephone has been touted for years," says Anil Kripalani, senior vice president, global technology marketing for Qualcomm in San Diego. "The Japanese are enamored of videophones and may well use them, but other markets may not. From the practical, pragmatic point of view, other applications may generate more revenue."

Users also can look for applications that will build on GPS technology. Beyond global positioning services, "location services will provide information about where you are," says Bill Stone, executive director of network technology for Verizon Wireless in Bedminster, N.J. "When you're traveling, you'll want to know where the nearest restaurant is. With mobile commerce, you might be sent a coupon for a restaurant near where you are." Real-time GPS capabilities will mean instant traffic updates and traveler advisories, among other applications.

The possibilities of 3G speeds are exciting. But the tentative way that carriers are approaching the technology should make any user weary. **SD**

Here Come the Smartphones

New wireless products bring function and a few challenges

Earlier this year, Fred Hann handed each of the 14 salespeople at Recovered Capital in Columbus, Ohio, two devices to carry with them at all times—a Web-enabled cell phone and a Handspring Visor. Between the handheld PC and the phone, reps are well-equipped to stay connected with headquarters via e-mail and phone, access their clients' account information stored back at the home office, browse the Web and keep their client information organized.

But Hann, chief auditing officer at the telecom auditing company, is not particularly happy with the two-fisted strategy. He had tried but failed to find a single, affordable lightweight device that was three

Although well-equipped, Recovered Capital's field staff is now left to tangle with the same problem that many mobile professionals contend with—belt loop proliferation. PDAs, including Palm's namesake device and Microsoft's PocketPC, cell phones and pagers each have a role in business, but to carry all these devices simultaneously is to end up looking something like Batman with his high-tech utility belt.

And it's not just a style issue. Multiple devices are inconvenient and bulky. They require considerable logistical effort to keep all the batteries charged. Such devices even present a potential security hazard: keeping track of multiple devices in a pub-

lic place can be challenging. It's also a pain to keep track of which information is stored on which device.

Hybrid devices face hurdles

The fact is, hybrid devices are still bedeviled by size, battery power and form factor trade-offs that are the baggage of a machine asked to serve a dual and sometimes triple purpose. "They're really not that popular, and they won't be hitting the mainstream anytime soon," says Stacy Wu, an analyst at Mobile Insights, a Mountain View, Calif., consultancy. "They're just not a good compromise now."

"Everyone embraces the idea of a converged single device right up until they have to make a trade-off on an important application," agrees Mark Guibert, vice president of brand management at Research In Motion, the Waterloo, Ontario, company that manufactures RIM's Blackberry pagers.

And then there are the security implications of these newer devices. "Since handheld devices are susceptible to viruses, as well, they present a whole new level of risk to network reliability," says Rita Khayat-Toubia, the CIO of Western Multiplex. "There is the danger that a new wave of viruses will enter our networks through these devices."

Still, hybrid devices are well worth keeping an eye on, especially for people who "want it all." Real technology advances are being made, and should those become a reality, there are strong economic arguments in favor of these units.

Hybrid devices today can be divided into two camps: those that started their life as PDAs and acquired voice features, and those that began as cell phones and were imprinted with PDA-style capabilities.

Most of these first-generation combi-

Combo devices: the good, the bad and the glitchy

Strengths	Weaknesses
Users can execute voice-and data-oriented applications on the same unit	Users are likely to reject devices that stray too far from the ubiquitous cell phone form factor
Access to complete PDA/desktop address book	Poor sound quality. As traditional cell phone companies embrace combo devices, this problem should disappear
Ability to run wireless applications on a cell phone	The lack of a nationwide wireless network
Combo devices make synchronization effortless	A greater potential single point of failure

things: a phone with good voice quality; an Internet access device; and a handheld PC, complete with easy-to-use controls.

"We sat through two generations of these phones, waiting for one that did what we thought we needed Web phones to do," Hann says. Thanks to limited coverage areas, these devices lacked the ability to connect his users everywhere they traveled—and clumsy interfaces made Internet access a hassle on the tiny screens.

That's why interest is high for the new hybrid voice/data devices such as Handspring's VisorPhone and Kyocera's Smartphone. These devices promise to offer cell phone capabilities, e-mail access, Web browsing and the information management of a PDA—all in one box.

Even if these two models had been available to Hann when he rolled out the

nation devices run the Palm operating system—the same OS behind handhelds from companies like Palm, Handspring, Sony and HandEra. That makes these devices immediately familiar to most mobile workers as well as compatible with thousands of software applications. Since Palms synchronize with desktop software like Microsoft Outlook, these devices also provide instant access to contact lists and can dial phone numbers by contact name.

The first real example of a data-centric combination device is Handspring's Visor, equipped with the VisorPhone plug-in phone module, which debuted late last year. This Palm OS-based PDA includes an expansion slot for a wide variety of peripherals, such as wireless modems, memory cards and digital music players. The VisorPhone plug-in turns a Visor into a voice-enabled PDA.

Vendors taking the other approach—incorporating PDA elements into a cell phone—include cell phone manufacturers Nokia, Kyocera and Samsung. The Kyocera Smartphone, for instance, is a traditional-looking cell phone with a flip-down keypad that reveals a Palm interface with 160-pixel screen, Graffiti writing area and application buttons.

Samsung ups the ante with a 256-color display. Its I300 model, in fact, blurs the line between data-centric device and cell phone: The device looks like a PDA with an integrated antenna. Like the Smartphone, the I300 includes e-mail and Web browsing. Its color display, however, gives it an edge when running applications and surfing.

Comfort as a factor

Sounds great, right? But look closer. While the VisorPhone works well as a data-centric device, it can be uncomfortable when used like a traditional phone. It's simply uncomfortable for users to hold it up to their heads. And with the Kyocera or Samsung phones, a headset is needed when users want to see the display while also using the voice capabilities. This defeats the purpose of the phone-like ergonomics of the design.

"Once you move to applications, you want to move toward data-centric devices, which aren't shaped like phones and [aren't] intended to be held up to your head," says Ken Dulaney, an ana-

"That's the problem with putting all of your eggs in one basket. When your batteries die, suddenly you can't use your handheld or your cell phone."

lyst at Gartner, a consultancy in Stamford, Conn.

And there are screen trade-offs, as well. Simply put, screens need to get bigger to be truly useful for Internet services and running such applications as CRM systems. Much of the limitation in screen resolution is a result of the Palm OS, which operates a single cramped resolution of 160x160 pixels.

Some companies are already taking the first tentative steps toward larger screens. Palm licensees HandEra and Sony have both patched the operating system to extend the Palm display beyond 160 pixels, and next year Palm will officially support higher resolutions in its Palm OS 5.

It's not all Palm, though; competition will also soon come from devices based on Microsoft's PocketPC and from Symbian, a company developing operating systems for wireless units. While slow to market, Symbian has many partners in the cell phone industry. These other devices will best Palm's screen size by three or even four times, raising the bar for users who want to see more data on their phones.

Screens also are limited by cost and simple real estate—users tend not to embrace larger devices, even if that means more display space. Nokia learned this lesson with its innovative but almost brick-like 9100 Communicator, a smartphone introduced in 1996 to poor sales in the United States. That's why future-generation devices may take advantage of head-mounted displays, such as small projectors discreetly hidden in eyeglasses.

Such a display can look quite large—seemingly as big as a desktop monitor—making screen real estate problems a thing of the past. "It's a bit geeky for today, but it's a model that will fit well

into the future because it involves only a small amount of hardware and you don't actually have to hold anything in your hand," says Craig J. Mathias, principal of Farpoint Group, a consultancy in Ashland, Mass.

The battery power factor

But battery life may turn out to be the single biggest factor determining the future of this technology. While all the combination models on the market today offer adequate battery life—similar to single-purpose phones—using them for data operations is a drain traditional phones don't need to worry about.

"That's the problem with putting all of your eggs in one basket," says Aaron Dobrinsky, CEO of Go America, a national wireless ISP headquartered in Hackensack, N.J. "When your batteries die, suddenly you can't use your handheld or your cell phone."

Although most users may be satisfied with the battery life in commercial products, combination devices are putting much greater demands on these batteries. The fact is, battery technology hasn't changed much in the last century—it just doubles in performance every 50 years, compared with processors, which double in speed every 18 months.

It has improved dramatically, however, in the past decade as the technology has evolved from alkaline to NiCD to NiMH to Lithium Ion. Batteries now offer increased power densities. It's this density that allows modern batteries to offer the same power as older cells in less space, or more power in the same volume. **SD**

The Integration Dilemma

Struggling to introduce wireless apps to a network never designed to accommodate them

An international provider of mobile data-management systems and services should not have trouble providing its own salesforce with PDAs and wireless access to a back-office ERP system, right?

Think again. A company fitting that description recently decided to help its 2,000 sales reps better manage their customer relationships by giving them up-to-the-minute pricing, product selection and order-tracking information via wireless

Even the integrator ran into obstacles, though, and the pilot program faltered in its early stages. As members of the salesforce traveled, they tended to encounter frequent dead zones of wireless coverage and lose their network connections. During these gaps in coverage, data were inaccessible, rendering the wireless devices essentially useless until a connection to the network could be reestablished. These dataless encounters could get pretty embarrassing, particularly

in the middle of client meetings, since the salespeople were trying to convince their clients to buy the very devices that were rendered inoperable.

The integrator eventually arrived at a solution, which was to install a caching mechanism on each device. Account reps can now download or upload customer data just before and immediately after a meeting, via either a dial-up or a wireless connection, depending on network availability.

It seems that even when a wireless provider and a wireless integrator are involved, wireless imple-

tations, databases, networks and servers that were never intended to run without their land lines, the path is fraught with challenges, delays and compromises. It's one thing to support individual users running simple e-mail programs on their PDAs and quite another to adapt multiple enterprise applications for use on multiple handheld devices. The job is as complicated as the types of devices used, the operating systems and the networks on which they operate, the required level of security and the complexity of the applications involved. Resolving the disparity among multiple platforms, standards, devices and applications is at the heart of solving the wireless integration challenge.

The complications begin with the wireless devices themselves. In many cases, handheld PCs seep into organizations gradually. People show up with Palms and RIM Blackberries and Handspring Visors, and then they start asking the IT department for e-mail support to go along with their contact lists and calendar functions.

When the organization gets more ambitious and starts to implement wireless applications at the enterprise level, things get complicated—especially when you have a variety of devices to support. Just ask Doug Roseoff, managing architect of online projects at West Group, an online provider of legal research in Minneapolis.

West Group has limited its wireless support to Palm, PocketPC and Blackberry devices. Still, just those three handhelds present a complex set of variables. Differing models, operating systems and carriers present myriad user scenarios, each of which must be carefully tested. As the number of applications grows, the situation is compounded.

Despite maintaining a test lab exclusively for wireless, Roseoff says his group has not been able to test every configura-

Can't we all just get along?

Some tried-and-true techniques to make integration easier

Key integration difficulty	Approach
Redesigning traditional applications to be used in a wireless environment	Use applications that are already Web-enabled. Their three-tier design is amenable to wireless environments. Retest all configurations any time server software is upgraded or new software is loaded
Slow download speeds	Deliver data in small, manageable chunks of no larger than 5KBs
Difficulty integrating data from multiple applications	Implement an integration hub, which links multiple applications and data across platforms
Supporting multiple devices and their many OS/microbrowser/network configurations	Limit support to the one or two most commonly used devices. Test thoroughly. Retest after any device, OS or network software upgrades
Data security	Leverage existing SSL encryption. For highest security, use a VPN

access to its SAP system. Most members of the sales team were already using handheld devices to manage their contact information and send e-mail, and they were accustomed to accessing the ERP system on their desk-bound PCs via the Web.

But in the course of planning the wireless system, this wireless vendor learned it would take several weeks—and possibly months—for its own IT group to deploy such a system. So it turned this spring to an outside integrator to do the job.

mentations are far from seamless.

The advantages of successful wireless implementations are powerful and will soon be essential. But it's crucial that companies not assume that a wireless network is identical to a wired one, just without the cables.

A thorny path

The advantages of a wireless network are not without initial costs. When IT tries to integrate a wireless approach with applica-

tion. "The test matrix is huge. We've had to be very careful to test those configurations most commonly used by our customers," he says.

In fact, designing applications for multiple wireless platforms is actually more complicated than designing cross-browser-compatible webpages, Roseoff says, since Web developers have to support a much smaller number of browser/operating system configurations.

Because of its content-rich applications, West Group has also had to contend with another issue—the relatively slow connection speed of wireless networks. The average connection speed is 9.6Kbps versus 56Kbps on dial-up networks and 1.544Mbps on T1 lines. West Group clients commonly download long, data-dense legal documents, which is a tough enough job over land-line networks and all but impossible over wireless ones. To make the content a bit more digestible, Roseoff installed a "chunking" layer to the front-end servers handling wireless traffic. "Now we send down 5KB chunks of data at a time," he says.

Start with the Web

The structure of the application itself also goes a long way toward determining integration success. It's easier, for instance, to leverage applications that are already Web-enabled than to adapt existing office applications. That's because applications already being used on the Web are supported by the standard, three-tier Internet architecture. The front end, or presentation level, is separate from the middle tier, where the business logic resides, and both stand apart from the back end, where the data sit.

This means that adding applications and support for new devices later on is somewhat easier than if the three components (presentation, business logic and data) remain unified.

With a few tweaks, applications that fit this structure can be extended to wireless. Modifying an application for wireless typically means changing the front end only, where the presentation layer is created. The middle and back-end tiers are virtu-

Achieving High-Capacity Campus Connectivity: Western Multiplex Solves TRIAC's Networking Problem

When North America's largest manufacturer of swimming pool accessories, TRIAC Industries, decided in January that it needed to expand its office space, the networking challenge began. TRIAC moved its accounting department to a building that was located 500 meters away from its main building and soon discovered that providing a high-speed connection between the facilities was not an easy feat.

To connect the two 100BaseT LANs, Operations Manager David Rice began exploring traditional landline options. Rice soon found out from his Local Exchange Carrier that there were no T1 or DS-3 leased lines available to connect the two locations. Even though the new building was only one street away from the old building, the only landline option available to connect the buildings was ISDN.

"ISDN lines would have made the phone connection, but the connection would have run at a speed too slow for high volume network access from Accounting to our Servers," said Rice. Rice then considered a laser solution, but "the laser had the drawback of weather interruptions during heavy rain or snow."

Rice ultimately chose Tsunami 100BaseT wireless Ethernet bridges from Western Multiplex. Tsunami gave Rice the "high-speed computer connectivity and the phone connection all in one package." Tsunami enabled data transfer between the buildings at a speed of 45Mbps in each direction, while its built-in wayside T1 line connected the PBX phone systems in the two facilities.

"When I compared the cost of leasing ISDN lines over five years, the cost was only slightly less than owning the whole Tsunami solution, with the added benefit of 10-20 times the speed," Rice explained. Tsunami was up and running within three weeks after TRIAC signed the purchase order, and "the staff has not noticed any difference between working at the new location and working at the old location. Even our CFO called to tell me he was impressed by the speed when he moved to the new location and did a program installation on his laptop," he added. For Rice, the immediate bandwidth availability Tsunami offered made it an easy choice. "I've had no user complaints which means that everything is working perfectly," said a very satisfied Rice.

For more information about Western Multiplex, visit www.wmux.com.

ally unaffected, except for handling and serving data queries.

Ultimately, a wireless or wired network hybrid will be infinitely more flexi-

ble, powerful and cost-effective. But as with any transition to a major technological advance, there's a lot of learning that has to happen. **SD**

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"YOU CAN'T ASSUME THE CAPITAL MARKETS WILL BE THERE WHEN YOU NEED THEM."

sense of branding of government services was necessary," Leavitt says. "This wasn't hypothetical to him. He demonstrated the power of a strong brand to each agency."

BRING BACK WHAT YOU SAW LIVING ON THE TECHNOLOGY EDGE

When Scott Dinsdale became CTO at an Internet startup in 1999, he had already spent years in the music industry. He served as CTO and CIO at BMG Entertainment from 1995 to 1999 (this after cofounding a financial data services company in the mid-1980s). Following BMG, Dinsdale did his version of the dotcom odyssey at FirstLook.com, a provider of streaming movie and video game trailers and videos.

If he took on the role of an upstart during the Internet boom, Dinsdale, 43, is now an establishment figure. Since the spring, he's served as executive vice president for digital strategy with the Motion Picture Association of America (MPAA). His mission is to help the movie industry fend off any Napster-like challenges.

"Because of digital technologies, the [movie] industry is undergoing a fundamental change in every phase—from creation to production through distribution. And I worried about whether these guys got it," Dinsdale says. But while he observed the music industry's initial slowness in dealing with the file-sharing Napster music network, the MPAA is not resting easy. So it's his job to figure out how some new challenger might approach the world of digital movies and uncover any weaknesses in the existing technology.

JOHN HNANICEK

DOTCOM CREDENTIALS
CIO, eToys.com

BEFORE THE STARTUP
CIO, Hollywood Entertainment; senior VP of IT, OfficeMax

NOW
President and COO, Paciolan

WHAT HE DOES NOT MISS ABOUT STARTUP LIFE
Capital markets

"When you're with a startup, you're trying to build something where it hasn't existed before," he says. "You have this attitude of insurgency that says, I don't care how big or smug they are or that their profits are 10 times my venture funding. You just go after them and look for their Achilles' heel." Dinsdale believes that his experience will help the movie industry's members "better prepare themselves for where potential threats are likely to come from."

It helps that Dinsdale knows about technology and how startups work, says Motion Picture Association President and CEO Jack Valenti. "We were looking for someone who knew how the cyberspace world operates and what the future might hold," Valenti says. "Scott understands the cyberspace world and is articulate enough to explain it to nonexperts while at the same time being credible and respected by the technical experts in our companies."

SLOW AND STEADY WINS THE PROFITS RACE

John Hnanicek has spent much of his IT career in retail. He was senior vice president of IT at OfficeMax and the CIO at video store chain Hollywood Entertainment. So you might say it was a logical step, rather than a cliffside leap, when he took his version of the dotcom voyage. The landing still hurt, though. As CIO for eToys.com, Hnanicek saw that startup's dreams burn up like so many millions of capital when it went bust in February. (KBkids.com bought what was left.)

As eToys closed up shop, Hnanicek began looking for a position that had growth potential but wasn't out of line with realities of the business world. "A lot of good business models got money and then proceeded to grow and invest at a pace that couldn't be sustained," he says. He believes that eToys.com could have been successful with lower ambitions.

Hnanicek, 37, is now president and COO at Paciolan, a 21-year-old software company in Irvine, Calif., that provides turnkey ticketing systems to colleges, arenas and other entertainment venues. Its systems sell more than 100 million tickets per year, he says.

The opportunity is clear: Offer new online ticketing capabilities that will allow Paciolan's customers to mine their own ticketing data and build stronger customer relationships. In Hnanicek's first month on the job, CEO Jane Kleinberger says, he realigned the company to focus on e-commerce. He laid off some workers, brought in new ones to focus on e-commerce project management and improved productivity, Kleinberger says. "With his background he understands the opportunities, new technology and possible pitfalls we may face."

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Hnanicek says he also has set up cross-functional teams (a dotcom staple) to bring perspective to decisions and make sure the company has adaptable contingency plans. And with the eToys.com experience still fresh, Hnanicek says it's important that Paciolan stays self-reliant. "You can't assume the capital markets will be there for you when you need them. The best thing is to raise money once, have a clear path to profitability, get there and access money on your own terms," he says. Kleinberger says Hnanicek has infused the company with fresh energy. "We needed someone who had been out there in the emerging world and could bring some new ideas to a well-grounded company," she says.

ENTREPRENEURS ERR. LEADERS ADMIT IT.

John Puckett was in denial. It was May 19, 2000, and Puckett, the CIO of Internet toy retailer ToySmart, had just given a talk to business students about his company's business model and future plans. As he finished, his cell phone rang. A moment later, he listened to company officers explain that ToySmart would cease operating—that day. "Every employee believed that we had moved mountains and built a world-class company," Puckett recalls.

Puckett, 56, now faces another urgent challenge. As vice president of business development at Polaroid, he works on helping the struggling photography company identify new lines of business. The urgency comes as Cambridge, Mass.-based Polaroid tries to turn itself around; as of August it had announced a debt restructuring and warned it would miss some loan payments.

Puckett's new role calls for spotting opportunities and acting on them quickly. He says a dotcom background helps him win colleagues' support in pursuing this goal. "[People] expect you to be different and will tolerate more of your different ideas," he says.

Puckett says he has used this credibility cache to promote a spirit where Polaroid people are not afraid to take risks and make mistakes. "In a dotcom, people more readily say, 'I did it,' because they learn that by not doing so they're wasting everyone's time trying to

figure out what caused a certain problem," he says. "As long as we're all learning from each other's experiences we come out ahead. That's the nature of the beast when you're moving

"PEOPLE EXPECT YOU TO BE DIFFERENT AND WILL TOLERATE MORE OF YOUR DOTCOM ATTITUDE."



JOHN PUCKETT

DOTCOM CREDENTIALS

CIO, ToySmart.com

BEFORE THE STARTUP

CIO, GTE Internetworking

NOW

Vice president, business development, Polaroid

WHAT HE LEARNED

To make good decisions with less information

so quickly—you *have* to do it that way."

At ToySmart, Puckett's team watched with some terror how quickly site traffic was building and realized that they had to figure out how to handle Christmas retail traffic without overspending on infrastructure. "We calculated risk with a limited amount of information, and even though we weren't kamikaze or stupid we took more risks than a traditional corporation would." It worked: The IT team applied smart network switches that directed traffic efficiently, and the Web store handled its traf-

fic spikes. "It took us two weeks what it would take corporate America a year to do," Puckett says.

Gary T. DiCamillo, Polaroid's chairman and CEO, says that Puckett's attitude has been an asset. "John brings a fresh perspective to Polaroid. He shows a bias toward action that engenders an entrepreneurial spirit in those who work with him," DiCamillo says. In the spring, for example, Puckett finalized a strategic alliance with a company called Active Photo to develop a wireless application for digital imaging. "He could not have completed [this deal] if he had been focused on the potential for failure," DiCamillo says.

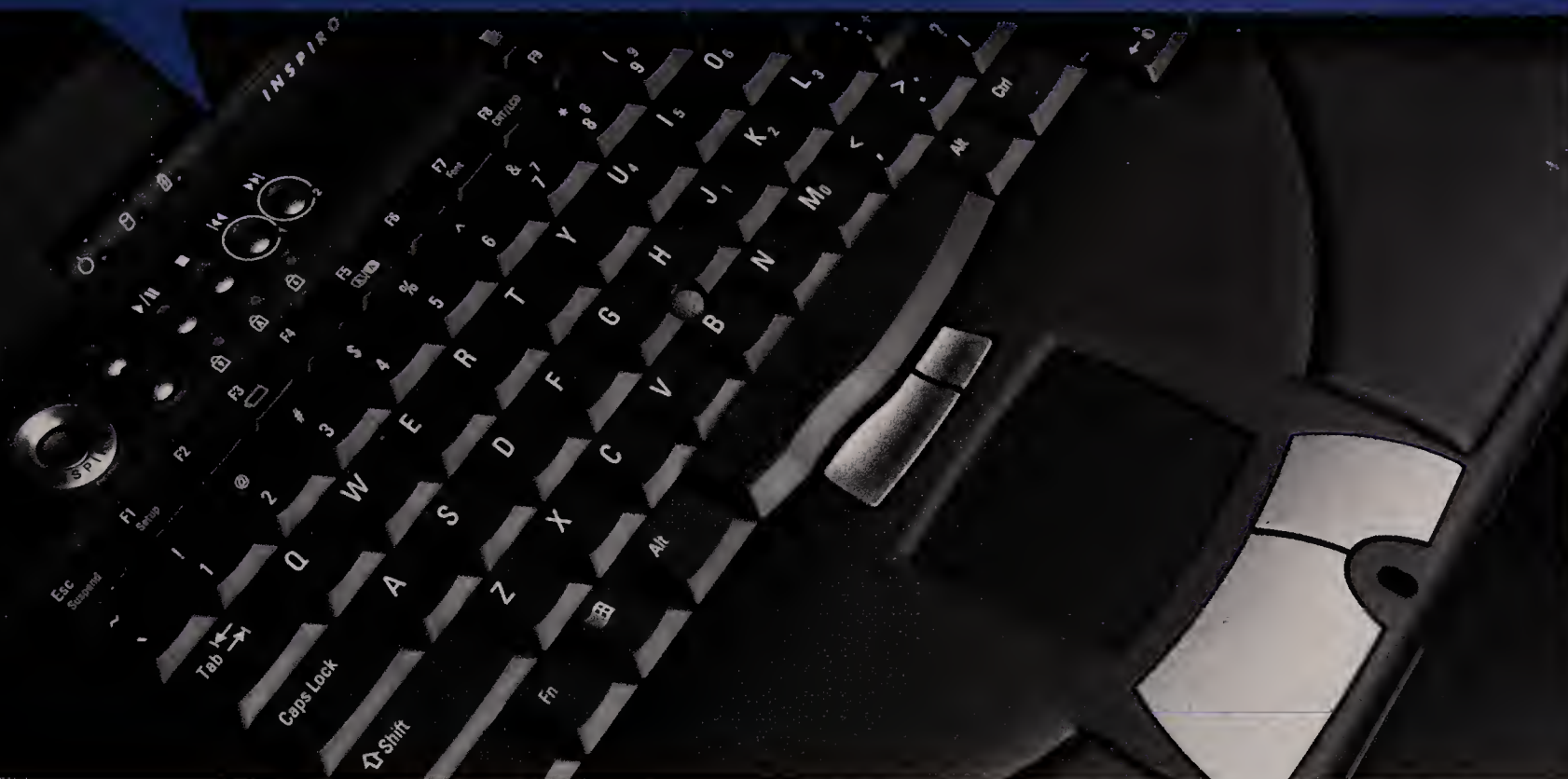
Puckett says the tumultuous dotcom ride was worth it: "I learned more in one year at ToySmart than I learned in the previous six years in corporate America." **CIO**

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See www.cio.com/printlinks for more coverage of CIOs who jumped to Internet startups.

Tell us about your time on the Internet front at letters@cio.com. Stewart L. Deck (sdeck@yahoo.com) is a freelance writer in Arlington, Mass.

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OUTSOURCED IN America

American Indian tribes are breaking in to the IT outsourcing business by offering offshore values at onshore sites BY TOM FIELD



From top, Bill Lewis, senior liaison for The LexisNexis Group; John Felt, CEO of Ute Tribal Enterprises; and Donald Lindberg, director of the National Library of Medicine.

In Belcourt, N.D., just south of Canada, the Turtle Mountain Band of Chippewa Indians sells data-entry services to the U.S. Department of the Treasury and the Internal Revenue Service.

On the open prairie in Eagle Butte, S.D., the Cheyenne River Sioux digitize old medical journals for the National Library of Medicine.

And in Fort Duchesne, Utah, due east of Provo, the Northern Ute Indian Tribe has partnered with Oracle to sell software and services to federal and commercial clients.

Onshore outsourcing options—that's what these American Indian tribes are offering (see "Homegrown Talent," Page 94).

It's the same low-cost and high-value work (we're talking data processing, imaging and call center support, mainly) that is traditionally found only offshore in such places as India, Ireland and the Philippines. These tribes have emerged as perhaps the only viable onshore alternative for CIOs seeking bargain-basement

Reader ROI

- ▶ See how entrepreneurial American Indian tribes are offering onshore some of the same low-cost, high-quality IT services available offshore
- ▶ Learn how CIOs can test the benefits of these new onshore companies



**By outsourcing onshore,
companies can avoid the
disadvantages of language
barriers, time zone differences
and security-sensitive work
that can't be sent overseas.**

Capitol Reef National Park, Utah

Outsourcing

IT services. Fortified by sound IT infrastructure and a desire to do the IT grunt work that larger onshore outsourcing vendors overlook, these tribal-owned businesses offer all the advantages of the offshore companies—without the challenge of language barriers, remote management or security-sensitive work that can't be sent overseas.

They've also got a hell of a marketing angle: historically disadvantaged people make good. No fewer than four consulting companies—just as many as there are Indian outsourcing vendors—are out drumming up business for the tribes. They argue that outsourcing to the reservations isn't just an opportunity to get baseline IT services cheap; it's a chance to bridge the digital divide, create jobs, build communities and raise aspirations for these American Indians, who were forced onto reservations 100 years ago.

And the pitch is working. Quietly, American Indian outsourcers are scoring significant contracts with federal agencies that are encouraged (but not required) by policy to hire minority-owned companies, and they're even racking up commercial deals with businesses that see no other onshore option

IT Nation

Spanning the country and the American Indian nations, these tribal-owned vendors are selling IT services

UNIBAND Belcourt, N.D.; owned by the Turtle Mountain Band of Chippewa Indians; specializes in automatic data processing. www.uniband.com

UINTA RIVER TECHNOLOGY Fort Duchesne, Utah; owned by the Northern Ute Indian Tribe; specializes in legacy data upgrades and replacement of client/server technologies. www.uintarivertech.com

LAKOTA TECHNOLOGIES INC. Eagle Butte, S.D.; owned by the Cheyenne River Sioux Tribe; specializes in data processing, call center support and document imaging. www.crstlti.com

LADUCER & ASSOCIATES Mandan, N.D.; specializes in data entry, business development and project management. www.laducer.com



Bill Lewis, senior international liaison for The LexisNexis Group, is planning a pilot outsourcing project with Lakota Technologies Inc.

and are swayed by the value proposition and the social arguments. "From a human perspective, it feels good doing something for the Indian reservations," says Virginia Callahan, senior practice director with Oracle's federal consulting group, which has served as a mentor and partner to the Northern Ute Tribe's year-old Uinta River Technology (URT) company.

But the challenge for the tribes is twofold: proving their capabilities in the cutthroat outsourcing marketplace and overcoming people's preconceptions of what the American Indians can and cannot do.

Offshore/Onshore Pioneers

Bill Lewis, senior international liaison for The LexisNexis Group, the global multimedia provider of news and information, is preparing to bring some work back onshore and into the hands of the American Indian

outsourcers. Conversion engineering—transferring information from a variety of print and electronic origins to a standard, Web-based format—is the bulk of the work that the Miamisburg, Ohio-based company outsources. Originally, this work went overseas to India, where the company realized savings of 40 percent to 60 percent because of the lower labor cost. But management of the offshore contracts was made difficult by language and time barriers. Also, because of security restrictions, some of LexisNexis's legal and government information simply could not be sent offshore, forcing the company to retain that conversion engineering in-house.

Then Lewis learned through business contacts of the new American Indian companies. And the more he learned, the more Lewis liked the option.

Lewis is therefore on the verge of initiating a pilot conversion project with Lakota Technologies Inc. (LTI) in order to evaluate the company's resources, facilities, quality of work and ability to scale up for increased demand. And so far, Lewis quips, "I have no reservations about [working with] the reservations."

PHOTO BY JOE HARRISON



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Nor do some of the customers who've already done business with the American Indians. Donald Lindberg, director of the National Library of Medicine in Bethesda, Md., has been outsourcing data-entry work to LTI since 1999—he was the company's first customer—and he started out as a skeptic. But the work came back well within specs, and Lindberg now has an ongoing deal with LTI to transcribe medical journals from the 1950s.

Tracy Tolbert, vice president of sales and marketing at Affiliated Computer Services (ACS), a Dallas-based IT services company, was one of the first clients of URT, the data-entry and applications services vendor that the Northern Ute Indian Tribe launched earlier this year. ACS, which typically sends much of its data-processing jobs offshore, heard about URT through a contact in the Utah governor's office. Tolbert says he was attracted by URT's eager labor force willing to do low-level IT work and the opportunity to keep security-sensitive jobs onshore.

Value Proposition

Sizing up onshore and offshore rates

IT'S ALWAYS TRICKY to compare outsourcing rates because so much depends on the individual contracts. But we asked one prominent outsourcing customer (who prefers to remain anonymous) to share the rates he pays for basic data processing in-house and offshore:

IN-HOUSE: \$50 to \$85 per hour (including benefits)

OFFSHORE: \$17 to \$30 per hour

The American Indian vendor rates fit somewhere in the middle. Because of the low cost of living on reservations, these vendors can afford to pay lower wages than many U.S. companies—but not the \$8,000 to \$12,000 per year that some offshore providers pay programmers.

The real value offered by the American Indian companies is that they can work cheaper than in-house staff and they work onshore, avoiding some of the language, management and security hurdles that have undermined some of the cost savings of offshore projects.

—T.F.

So ACS hired URT as a subcontractor to help complete a major data-processing project for the state of Illinois. And Tolbert says that URT has quickly delivered high-quality work. "We have a great need for a domestic workforce. We can give [URT] as much work as they can do."

Rebirth of Nations?

The American Indian onshore outsourcing movement began quietly about 10 years ago. The Turtle Mountain Band of Chippewa Indians in North Dakota was first. In 1989, the tribe created Uniband, its data-entry enterprise, which in 1991 became certified by the federal Small Business Administration (SBA) as an 8(a), or minority-owned company, allowing it to compete for

government contracts that are set aside solely for 8(a) companies. The status helped Uniband land data-entry deals with such federal agencies as the INS, IRS and Department of the Treasury. And those initial deals were so successful (\$30 million in contracts in the company's first five years) that Uniband grew to employ 1,000 people and spawned a telemarketing spinoff, Dyna-Band. By 1998, Uniband also grew beyond the SBA's definition of "small business," so it lost its 8(a) status and today competes successfully for commercial and non-8(a) government contracts.

Uniband's success sparked a new, entrepreneurial movement within the American Indian nations. JD Williams, CEO of LTI, stumbled upon Uniband in 1996 and quickly saw an opportunity for his own Cheyenne River Sioux people. He convinced the tribal leadership to bankroll an IT services startup, secured 8(a) status and opened LTI's doors in December 1997. (For more on LTI, see "Homegrown Talent," Page 94).

Also in 1996, Laducer & Associates, an American Indian-owned business in Mandan, N.D., entered the IT services field as a way of diversifying the company's offerings. Specializing in data entry, Laducer initially worked as a subcontractor with

John Felt, CEO of Ute Tribal Enterprises, says the American Indian-owned companies provide badly needed "living wage" jobs.





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Uniband, and by 1999 it began securing its own deals with the IRS and other federal agencies. Today, Laducer employs 250 people and occupies two facilities in Mandan and Minot, N.D., which are not on but near Sioux Indian reservations.

The newest American Indian vendor is URT, which is in the process of finalizing scanning and data-processing contracts with the Department of Defense just after gaining 8(a) status earlier this year. The key to URT's quick success is a partnership with Oracle, which not only has mentored the vendor throughout the startup process but also certified it as an Oracle reseller in the federal government marketplace. Brought together by the Department of Agriculture's Project Bravo (Building Rural America Venture Opportunities), which matches small startups with big-business mentors, URT and Oracle have a unique, nonmonetary relationship. Oracle offers management expertise, counsel and products to sell, while URT gives the software services giant a good story to tell (big-name company lends helping hand to American Indians). URT hopes to employ as many as 300 people by the end of 2002. "[URT] is the fastest-growing part of the business," says John Felt, CEO of Ute Tribal Enterprises, which operates seven different businesses, including a grocery store and a finance company.

Each of these American Indian-owned companies has a common goal: to create jobs and wealth on reservations that historically have lacked both. "There are a lot of jobs on the reservation—minimum wage jobs, but there aren't a lot of *living* wage jobs," Felt says. Even a \$10-per-hour job—hardly a big salary in the city—could make a huge difference to a tribal member on the reservation.

Each of these companies also has invested wisely in IT infrastructure and training. They've either built their own infrastructure systematically (LTI, for example), or leased access to satellite technologies and broadband (URT), and they've formed strategic relationships with local community colleges—or even their commercial partners—to train workers in at least entry-level IT skills.



Donald Lindberg, director of the National Library of Medicine, outsources medical journal transcription to Lakota Technologies.

Risks and Rewards

The industry analysts contacted for this article knew nothing of the American Indian outsourcing vendors that have already penetrated the marketplace. That is because the deals American Indians have done have been relatively small, and en masse they've caught no one's attention as a legitimate trend. That's good news for prospective customers because it means they still have the opportunity to get in on the ground floor of the onshore movement and shape it to meet their needs. But beyond pricing and location, would-be clients also must look at skills and, of course, the vendors' ability to scale up to handle business growth. To evaluate these potential partners, Frank Casale, founder and CEO of The Outsourcing Institute in Jericho, N.Y., recommends three things: check references from past and current customers, evaluate and investigate the vendors' reputation, and talk to the vendors' partners.

cio.com

For more information on this topic, visit our **OUTSOURCING RESEARCH CENTER** at www.cio.com/outsourcing.

In many ways, American Indians are entering the outsourcing marketplace at a good time. There's plenty of work to be had, and for some CIOs the offshore honeymoon is over; they're looking for a low-cost and high-quality onshore option. And right now these tribal-owned companies are it.

But at the same time, the domestic outsourcing industry is increasingly competitive. Many of the smaller vendors are being gobbled up. And in this economic slowdown, many of the larger vendors are starting to pay more attention to low-end business that they would have ignored even a year ago. In response, the offshore vendors, which had begun to raise their rates to fuel their own business growth, are starting to roll back their prices and reestablish themselves as the lowest-cost service providers.

So whether the American Indian-owned outsourcers will prove to be anything more than bit players is for the market to decide.

But just claiming a piece of American commerce might be enough. **cio**

What are you willing to outsource to an onshore American Indian vendor? Tell Executive Editor Tom Field at tfield@cio.com.

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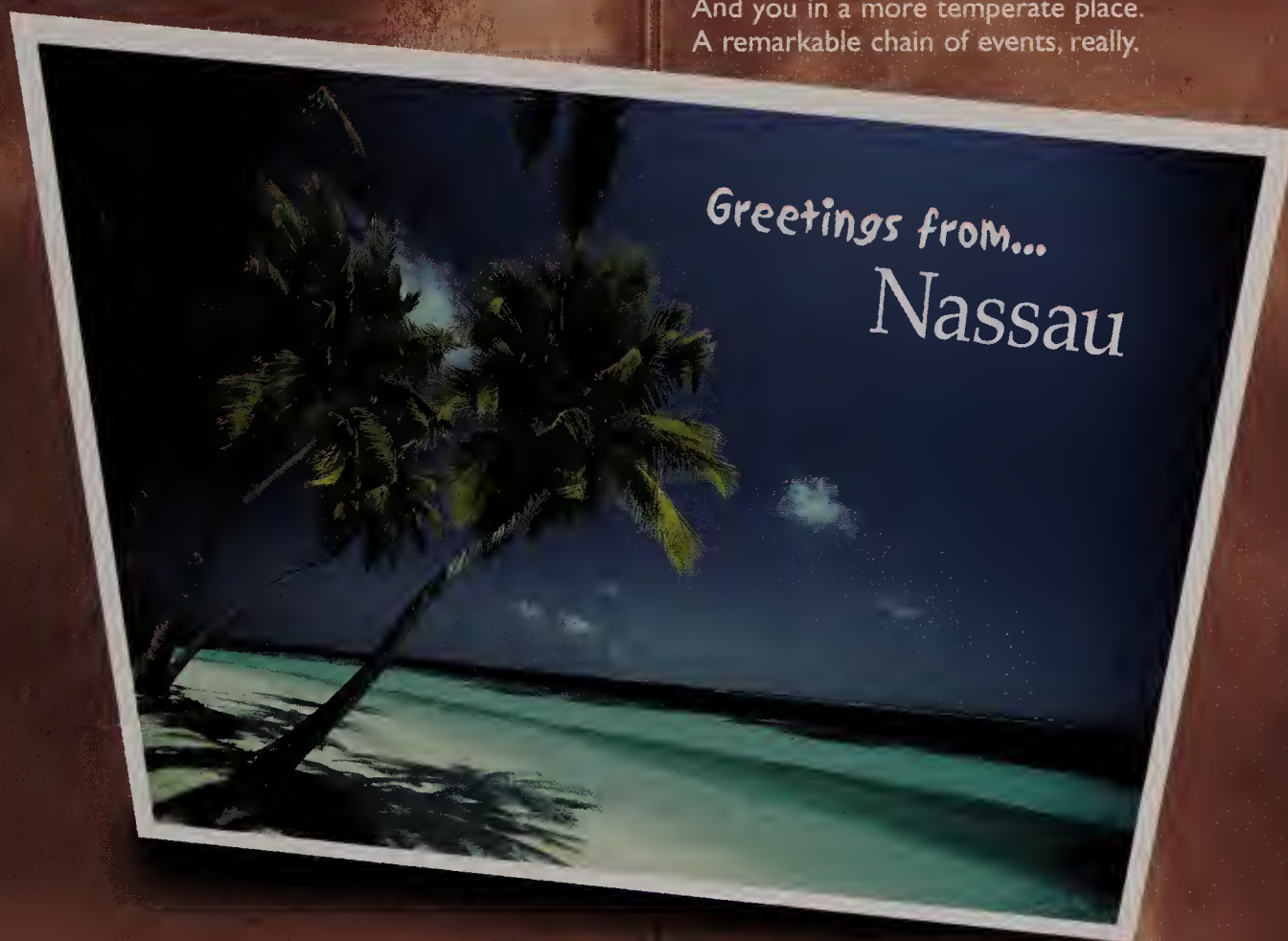
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HOMEGROWN

One Sioux reservation is investing its future in an IT services venture called Lakota Technologies Inc. BY TOM FIELD

THE EAGLES TAKE FLIGHT, AND THE CEO'S HOPES SOAR WITH THEM.

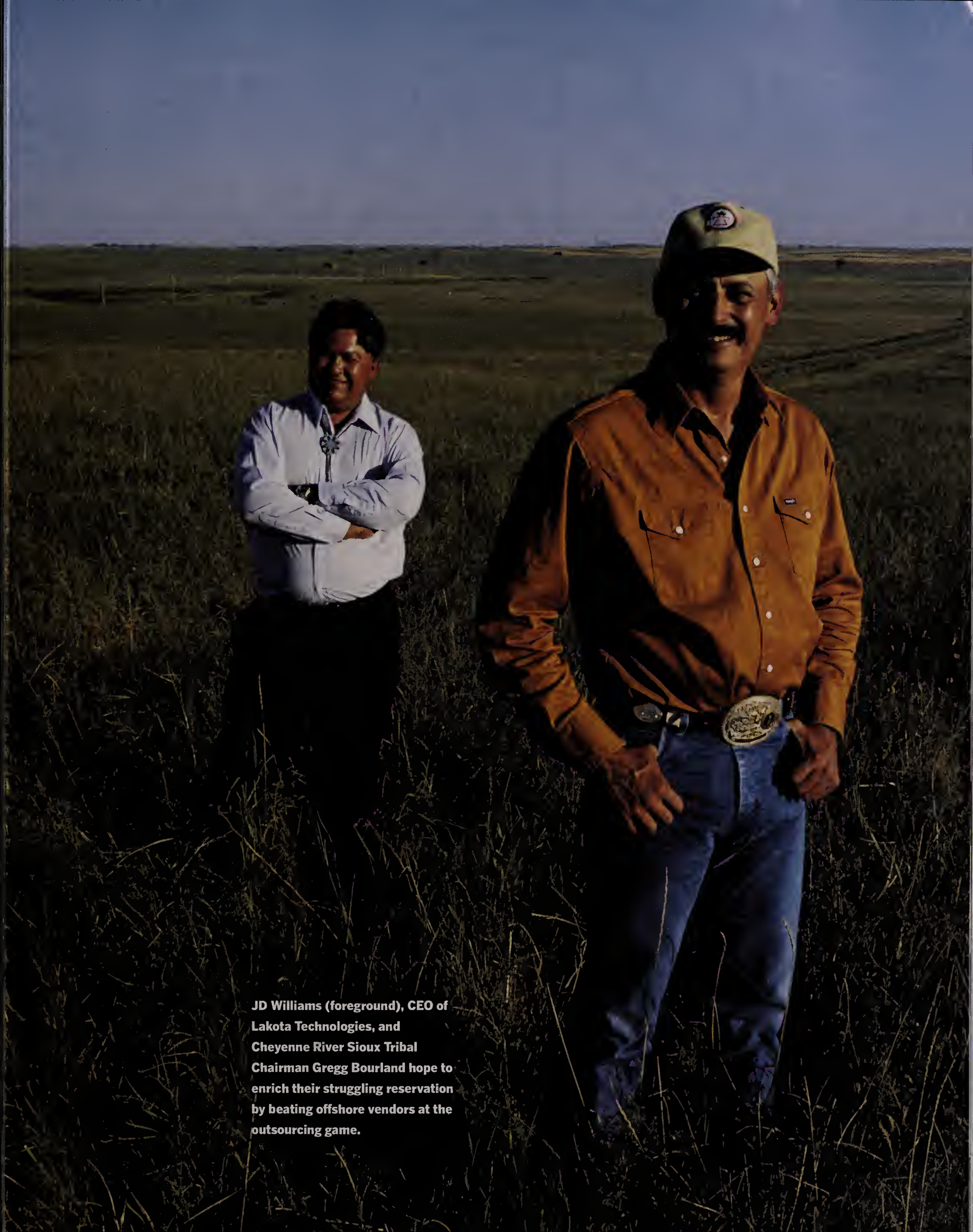
Two, six, a dozen eagles—they're everywhere in the skies above U.S. Highway 212 in rural Ziebach County, S.D., smack in the middle of the Cheyenne River Sioux Indian Reservation. JD Williams, the plainspoken, denim-clad CEO of Lakota Technologies Inc. (LTI), is giving a windshield tour of the reservation, and he's absolutely awestruck by the eagles. A Sioux native of the rez, as it's called, Williams has never in his 45 years seen so many eagles on a single day. "It's a sign to Indians, you know," Williams says as one eagle takes flight with a wingspan that could envelope his Chevy Blazer. "When you see an eagle soar like that, it's a sign of good luck, of prosperity to come."

To Williams, the eagles represent dreams—not just for LTI, his startup enterprise, but also for his impoverished people. Williams's dream is to bring the offshore outsourcing model onshore (see "Outsourced in America," Page 86)—to convince companies to send LTI the same data-entry, call center and document-imaging jobs they're currently sending overseas to India and the Philippines.

He has a good argument: Overhead costs are low and labor potential is high

Reader ROI

- See how the Cheyenne River Sioux Indian Tribe is bridging its digital divide by creating an onshore outsourcing option
- Find out what initial customers and prospects have to say about this new outsourcing solution



JD Williams (foreground), CEO of Lakota Technologies, and Cheyenne River Sioux Tribal Chairman Gregg Bourland hope to enrich their struggling reservation by beating offshore vendors at the outsourcing game.

on the rez in Eagle Butte, where even those low-level IT services jobs could mean a huge bump in the standard of living. Rates vary by contract and customer, of course, but it's fair to say that if U.S. companies are paying their IT employees \$40 to \$80 per hour for baseline IT services, and offshore companies are charging \$15 to \$30 per hour, then LTI fits somewhere in the middle, offering solid value without the communication and management headaches that come with offshore projects.

But Williams also has a huge challenge: convincing skeptical customers—and even some of his own people—to trust their future in an unproven American Indian-owned venture. It's a leap of faith, after all, for CIOs who've been burned by the failure of seemingly well-heeled ASPs, or even had bad offshore experiences, to suddenly turn over even their noncritical systems to a shoe-string-budgeted startup located in one of the nation's poorest regions. For Williams, LTI is an entrepreneurial challenge. "Can we succeed," he asks, "and be a dynamic force in people's lives?"

Life on the Rez

Lord knows the rez needs dynamic change. Isolated in central South Dakota, 90 miles northwest of Pierre, the state capital, on a chunk of prairie about the size of Connecticut, the 9,000-member Cheyenne River Sioux are rich in spirit and tradition, but dirt-poor by any traditional measure. Unemployment ranges from 65 percent to 80 percent. Many residents work for the tribe or the U.S. government (both the Bureau of Indian Affairs and Indian Health Services have offices in Eagle Butte), but commercial jobs are few.

This isn't the way life used to be. The Cheyenne River Sioux are the same fiercely independent people who in 1876 followed Sitting Bull into battle against Gen. Custer at Little Big Horn. Williams, whose grandmother witnessed Custer's last stand, still lives in the family homestead built near the town of Faith in 1903.

And for most of the past two decades, Williams has battled what we now call the

Vital Statistics

LAKOTA TECHNOLOGIES INC.

Eagle Butte, S.D.

www.crstliti.com

OWNED BY: Cheyenne River Sioux Indian Tribe

CEO: JD Williams

ESTABLISHED: 1997

EMPLOYEES: 28

SERVICES: Data processing, call center support, document imaging

CUSTOMERS: National Library of Medicine, Computer Generated Solutions

digital divide. With the goal of creating the most wired rez in the country, the Cheyenne River Sioux Telephone Authority (CRSTA) has steadily invested in state-of-the-art telephone, cable TV, wireless and broadband technologies, including \$350,000 in startup costs for LTI. Today the rez is more infrastructurally sound than all of India, the offshore outsourcing capital, where power and telephone services fail regularly.

At the same time, urged by Tribal Chairman Gregg Bourland, the tribe has undertaken an aggressive education campaign to ensure that residents have the necessary computer skills. Providing an opportunity to ply these skills is the backbone of Williams's vision for LTI and its promise to bring high-tech, high-paying jobs to the Cheyenne River Sioux. Established four years ago in the basement of the CRSTA, LTI puts local residents to work. They offer tactical IT services—data processing, document imaging and call center support—to larger companies looking to get this work done quickly and inexpensively. LTI was inspired by the Turtle Mountain Band of Chippewa Indians in North Dakota. In 1991, that tribe's data-entry enterprise, Uniband, became the first American Indian reservation to venture into the IT outsourcing space (see "Outsourced in America," Page 86). When he visited Uniband in 1996, Williams saw the opportunity for his own people. He returned home and convinced the tribal leadership to bankroll an IT services startup. LTI opened its doors in December 1997.

JD Williams, CEO of Lakota Technologies, says that low overhead costs and plentiful labor make the reservation's IT services a viable onshore outsourcing option.



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Today, LTI's staff consists of Williams and roughly 28 employees who do the bulk of the company's work—data entry, mainly, for a trio of projects contracted from the National Library of Medicine.

Getting the Business

Donald Lindberg, director of the National Library of Medicine in Bethesda, Md., became LTI's first customer in 1999.

When LTI bid on the contract to make electronic files out of the library's original 1957 journals, Lindberg knew it was an untried vendor, but he liked the opportunity to keep this data-entry work onshore. It's key work for the library, which houses roughly 15 million medical documents, with 450,000 new ones added each year. Though initially wary of the untried vendor, he was happy with the results. "Our folks did a lot of checking [when the initial data came back from LTI], and they were totally delighted," Lindberg says. The work came in within the bounds of its three-month trial period and with greater than 90 percent accuracy. Subsequently, LTI landed two additional library contracts for transcribing medical journals.

One commercial business willing to give LTI a shot is Computer Generated Solutions Inc. (CGSI), a Washington, D.C.-based IT services vendor that recently signed a memorandum of understanding to use LTI as a subcontractor on big outsourcing deals. By partnering with CGSI, LTI gets an easy entry to some of the big vendors' contracts, and employees get to take advantage of new training opportunities. In summer 2000, CGSI flew 10 LTI employees to Dallas for six weeks of call center training—invaluable skills in the IT services field. In return, CGSI gets access to low-cost labor *and* the tax breaks and special considerations of partnering with a minority-owned business. John Emelio, a Washington, D.C.-based consultant for the Native American Marketing and Development Corp., which has helped LTI market its wares to federal government agencies, is optimistic that the National Library of Medicine and CGSI contracts are the beginning of boom times for



Tribal Chairman Gregg Bourland has led an aggressive education campaign updating computer skills on the reservation.

LTI. "If we can knock over a couple [of contracts], it'll get started and spread," he says.

Defining the Future

Tribe Chairman Bourland, a Web-savvy leader (essentially the mayor but also the webmaster) who's long sought a piece of the IT services pie, bitterly recalls the tribe's first attempt to create technology jobs on the rez. About a decade ago, the Cheyenne River Sioux courted a major credit card company that wanted to build a 250-job data-processing facility in South Dakota. Ultimately, the company rejected Eagle Butte, telling the tribe its labor force lacked sufficient IT skills. "I was furious...at us—that we'd not had the foresight to train people in our own schools," Bourland recalls.

Today, the reservation's tiny school system has an ambitious K-12 computer training program, and even the local community college has shifted its emphasis to computer careers.

"After all, we don't know where the next

Microsoft will be developed, but it may be right here in Cheyenne River," he says.

So far, it's been a good year for LTI.

Since January, the company secured a new five-year contract to continue transcribing journals for the National Library of Medicine, and Williams reports there are some other strong prospective deals in the works with two other government agencies and a private enterprise. In May, ground broke on a new 10,800-square-foot LTI facility, which is scheduled to open its doors Dec. 1. In two or three years, LTI may employ hundreds.

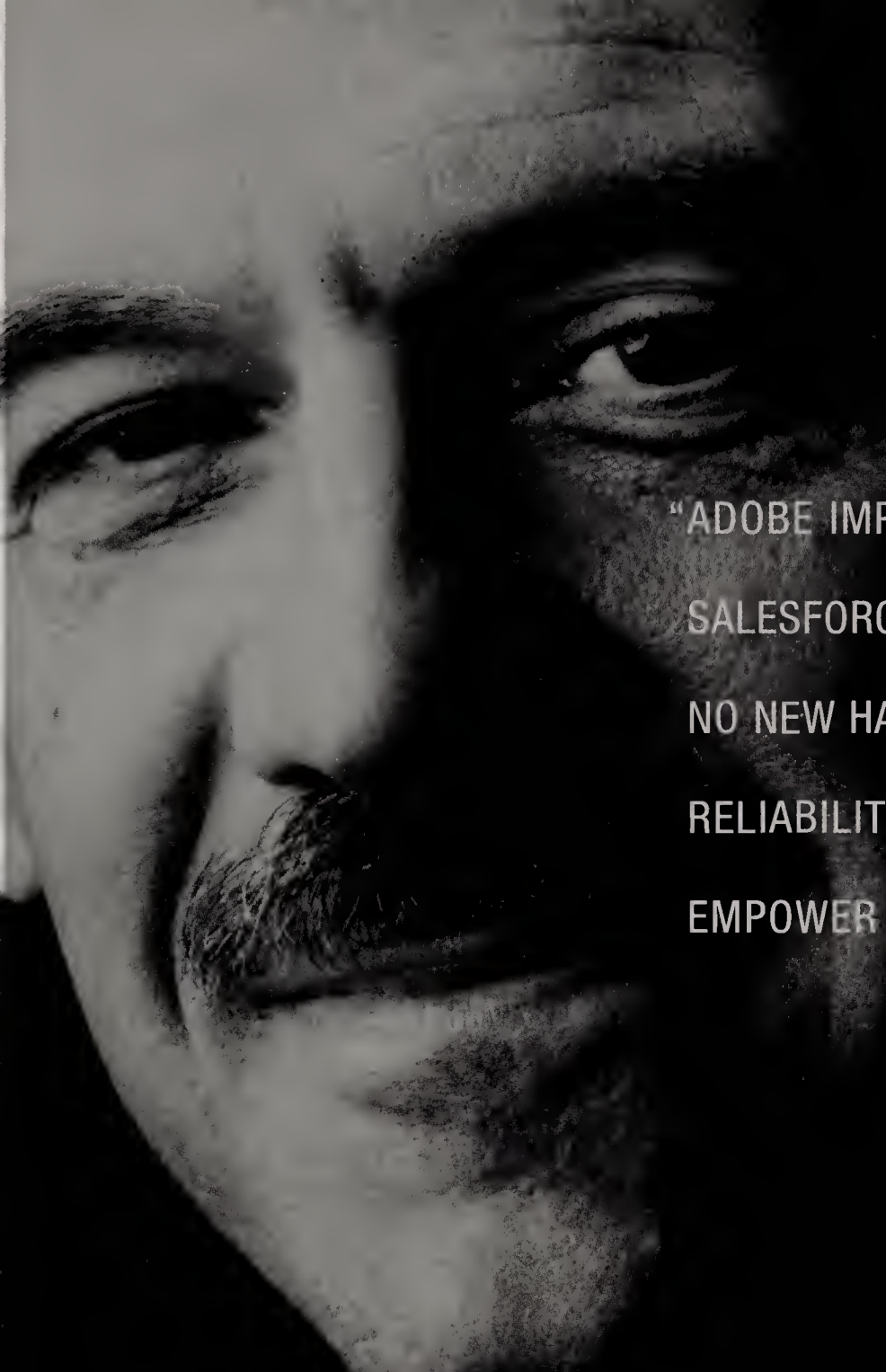
Williams now spends much of his time traveling to Washington, D.C., spreading the word about LTI and trying to attract business. "There's a lot of visiting, talking, setting up and nurturing, but someday it will pay off," he says. "The radishes come first in the spring—they're the small projects—but the corn always comes in the fall."

Williams pauses for a moment, recalling the eagles in flight. "There are too many eagles in our lives for anything else [but success] to happen." **CIO**

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What advice would you offer this startup IT services vendor? Tell Executive Editor Tom Field at tfield@cio.com.



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*Far from the
competition of
the World Series,
Internet technology
has introduced Major
League Baseball to
a whole new concept:
cooperation*

BY JON SURMACZ

It's a hot June afternoon. In the temporary office of Major League Baseball Advanced Media (MLBAM), the company in charge of Major League Baseball's 31 websites, electric fans shoo tepid air around bunkers of cardboard boxes, struggling with a decidedly minor league air-conditioning system. Dozens of twentysomethings crawl over one another, scurrying to prepare for tonight's games and to post the latest news. Cal Ripken Jr. announces that he will retire at the end of this season. The office buzz spikes with whispers of a trade: Ugueth Urbina, ace reliever for the Montreal Expos, might be moving to the Bronx as part of a trade to bolster the Yankees bullpen. (Six weeks later, he's traded to the Boston Red Sox instead.)

Here, on the ground floor of New York City's Chelsea Market, two dozen writers, editors, designers and producers show up seven days a week to stage an instant

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replay of what working at a dotcom used to be like—hopeful young people burning through a reported \$50 million faster than you can say Doug Mientkiewicz.

This is the heart of what Major League Baseball wanted and believed it needed: a centralized, integrated website that would replace the individual team sites that had sprung up over the past few years. A website that would be all things baseball to all baseball fans. A website that had features that worked as advertised and had the potential to generate revenue for its 30 member teams. Now, as the World Series

Reader ROI

- How the Internet encouraged baseball teams to work together
- Why MLB.com used a common template for many websites
- How MLB.com hopes to cash in



approaches, it's clear that MLBAM has done much more than put baseball online. It has changed the way baseball does business, replacing winner-take-all with a more cooperative model, one that might never have been born if not for the opportunities presented by Internet technology. The only question left is, Will that new business model work?

CHANGE-UP

It all started in spring 1999, when Major League Baseball signed a three-year agreement with SportsLine.com, a Fort Lauderdale, Fla.-based Internet company that produces its own sports news site as well as sites for other pro teams and leagues. For its part of the deal, SportsLine agreed to develop and maintain the league's site (www.majorleaguebaseball.com), sell the advertising, and handle the site's functions for moving merchandise. In exchange, Major League Baseball and SportsLine would share the revenues generated through sponsorships, advertising and e-commerce. The arrangement was like many that Bob DuPuy, MLB's executive vice president for administration and general counsel, had seen before. And DuPuy believed that Major League Baseball was selling itself short.

The way DuPuy saw it, baseball had to make a choice: Sell out or shell out. It could work with SportsLine, share the take and potentially collect tens of millions. Or it could negotiate its way out of that arrangement, start from scratch and keep everything for itself. At the end of the 1999 season, just a few months after signing the deal with SportsLine, MLB Commissioner Allan H. "Bud" Selig called a meeting with DuPuy, Paul Beeston, the league's president and COO, and Jerry Reinsdorf, owner of the Chicago White Sox. Selig asked them directly, "What's our Internet strategy?"

"We all looked at each other and said, 'Well, we have a site that does OK that's hosted by SportsLine.com,'" recalls DuPuy. "The clubs have sites, and they're OK. And we're sort of chugging along. We made about \$1.5 million on it last year [1999]. We're gonna make a little more than that this year [2000]."

But baseball is a \$3 billion industry. And everyone in the meeting knew that \$1.5 million wouldn't be enough to sign a journeyman infielder with a .225 career batting average, let alone fuel a critical piece of baseball's new economic order. DuPuy knew there had to be a better way. So he and a group of owners—Jerry Colangelo of the Arizona Diamondbacks, Thomas Hicks of the Texas Rangers, Drayton McClain of the Houston Astros, David Glass of the Kansas City Royals and Reinsdorf—set out to find a better answer to Selig's question.

After three months of research and debate, the group concluded

that baseball's best option would be to create a spinoff business to run the league's Web arm. The outfit would be equally funded by the teams, which would share the startup's revenues, estimated to be much more than the million-plus it had generated in previous years. Most important, the plan put baseball in control, a condition that DuPuy believed would appeal to the owners.

"It has always been [the owners'] desire to protect the asset," says DuPuy. "They know they have to be prepared for the future, to be prepared for wherever the Internet ends up taking us."

There was, however, one problem that was apparent to DuPuy: The plan required those teams in larger markets—teams with the clout to negotiate their own Web production and sponsorship deals (worth millions to the New York Yankees and San Francisco Giants, for example)—to cede those rights and revenues to the league. DuPuy knew that part of it wouldn't be an easy sell. The business of baseball was every bit as competitive as the sport itself.

"Baseball started not only before the Internet and cable TV, not only before broadcast TV, but before radio," says DuPuy. "There were 16 markets and they made all of their money locally. They made it on local ticket sales; they made money on local sponsorships and eventually local broadcast rights—unlike some of the other leagues that sprung up and grew as national broadcast media became more prevalent. We have an ingrained history of local rights. That was a very sensitive issue."

In January 2000, DuPuy presented the plan at the owners' meeting in Phoenix, with help from consultancies McKinsey & Co.

and Morgan Stanley Dean Witter & Co. They outlined a strategy for the Web, then talked about another looming issue: the lack of competitive balance in the league. It was well-known that during the 1990s, baseball had settled into a league of haves and have-nots. The haves had the highest-paid players and the World Series titles, and the have-nots had low payrolls and mounting losses—games, fans, cash, you name it.

"The commissioner [Selig, who was also the owner of the small-market Milwaukee Brewers from 1970 to 1998] was bound and determined to restore more competitive balance," DuPuy says. "No one knew where the Internet was going to take us, but for once we were poised to take advantage of this opportunity for ourselves. No one said, 'Gee, this is a bad idea.'"

In fact, the owners decided that it was not a bad idea. In an unprecedented show of cooperation, the owners voted 30-0 in favor of the plan for completely revamping the league's Web properties. In doing so, they cast a yea for competitive balance as teams would equally share in all of MLBAM's net profits. It was a nifty double play for DuPuy.

THIS SEASON,
MLBAM CEO BOB
BOWMAN EXPECTS
TO SELL ABOUT
1 MILLION TICKETS
ONLINE, GENERATING
BETWEEN \$5 MILLION
AND \$10 MILLION.

A woman in a dark business suit is running from left to right across the foreground, talking on a mobile phone. In the background, two astronauts in full space suits are standing on a city street. To the right, a man in a dark suit is bent over, looking at a laptop. The scene is set on a city street with ornate street lamps and a clear blue sky. The IBM logo is in the top right corner.

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Lost in the Translation

A quick look at the San Francisco Giants' website, before and after MLB.com

WHAT'S GONE

Webcam: Although it has been reinstated, this popular feature that allowed fans to peek inside Pacific Bell Park and pan and zoom in and out as they pleased had been removed until midseason, for financial reasons.

Chat: An unmoderated chat room where fans could toast or roast their heroes. MLBAM removed chat rooms to save money.

WHAT'S NEW

Video: Access to MLBAM's Custom Cuts video, which allows users to search for video clips and produce their own highlight reels.

Fantasy games: Fans can create their own rotisserie league.

Statistics: While the Giants' earlier site did have Giants' player stats, they were much less comprehensive than those offered now. Users also have access to MLB.com's statistics database.

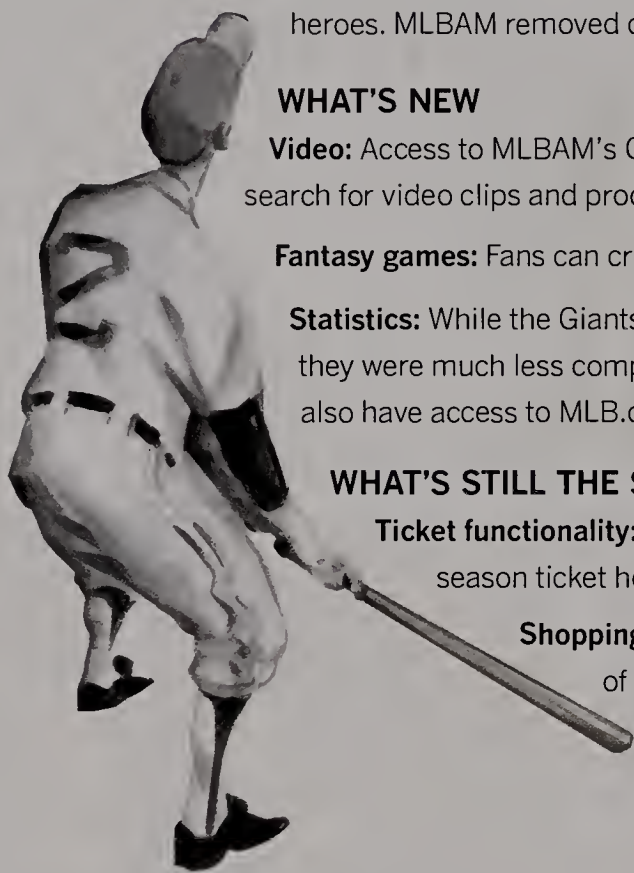
WHAT'S STILL THE SAME

Ticket functionality: The Giants double-play ticket window allows season ticket holders to resell their tickets to other fans.

Shopping functionality: There is a greater assortment of products, not just Giants gear.

Real-time scoring of games: Still a hit.

SOURCE: BILL SCHLOUGH, VICE PRESIDENT AND CIO, SAN FRANCISCO GIANTS



DOING THE WORK

By February 2000, the MLBAM roster was taking shape. DuPuy himself was chairman. The Web consultancy Scient won the bid to design the sites and develop the Web publishing system, and McKinsey & Co. helped put together MLBAM's business staff. Meanwhile, DuPuy went looking for a president and CEO—someone who could turn MLBAM into a winner. In November 2000, he hired 46-year-old Bob Bowman, former president of ITT and ex-CEO of dotcom Cyberian Outpost, which sold home computers and office technology and was recently acquired by PC Connection. Bowman didn't have a lot of time to get comfortable—MLB.com was scheduled to launch on Jan. 31 and gradually ramp up its editorial content, advertising and sponsorships, technology partnerships, and staff as spring training approached in mid-February.

The mission of MLB.com was clear: To become the most comprehensive baseball resource on the Web for fans and create a viable source of revenue for the league's owners. The keystone of the site was its database of statistics, which was designed to spoon-feed every possible crumb of baseball minutiae. Virtually all game statistics were

synced with MLB.com's real-time game-scoring graphics so that fans could watch games that they could not attend or see on TV. By midseason, the database was tied to a searchable, indexed archive of video clips of every game—for example, a search of Barry Bonds's home runs against left-handed pitchers during May afternoon games at Pacific Bell Park would return a clip of a May 27 two-run dinger off the Colorado Rockies' Denny Neagle in the bottom of the first inning, which came on a 3-1 pitch. Bowman planned to complement the stats with in-depth coverage of baseball news, feature stories and columns written by professional baseball writers, as well as fantasy games and other gimmicky odds and ends.

For the owners, Bowman promised three sources of revenue: e-commerce (online ticket and merchandise sales and auctions), subscriptions for exclusive content (for example, audio and video), and sponsorships and advertising.

By opening day, Bowman had 175 people working for him, 71 of whom worked offsite with individual clubs. Every team's site was up and running, and as expected, there were some grumblings from fans of last year's independent sites. Bowman had known that MLBAM's use of a common template for every team would rub many fans the wrong way, but he believed that the gains—a high standard of quality for each

site—outweighed the losses. Not everyone agreed. (See "Lost in the Translation," this page.)

"The navigation and design feels very much like the Internet circa 1997," says Patrick Keane, a Jupiter Media Metrix senior analyst who studies sports media and online advertising. "I can appreciate the need for a network model and a place to accumulate all of that content, but I think it becomes very sterile when all of the sites have the exact same look and feel."

Critics of the one-size-fits-all strategy had warned that it might anger fans, which is one reason the National Hockey League lets its teams manage their websites locally—as baseball used to do—with more editorial and design freedom.

"Under our guidelines, team websites can be distinct in terms of look, feel and coverage. It gives you the opportunity to go out and do some unique things," says Rich Libero, vice president of editorial and production for NHL.com. "But if you're not doing it the baseball way, you run into consistency problems from site to site. One-third of your sites may be really good, another third is OK, and there's a third that isn't putting out the effort that it needs to put out."

For teams such as the San Francisco Giants and the Seattle



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Mariners, clubs that were setting the pace for baseball on the Web, the design scheme represented a step backward. But as Giants Vice President and CIO Bill Schlough concedes, it will allow teams to offer more features that would have been too expensive under the old model—even though the Giants had an enviable site.

“The changes that we went through were pretty dramatic,” Schlough says. “For the past five years our fans had really built the site. The new site didn’t reflect direct feedback from Giants’ fans. But long term, it’s the best move for baseball and the Giants as well, just for the economies of scale.”

Online, all-in-one branding was hardly a novel idea. It had been put to work by some of the biggest media companies on the planet and has gone down in flames more than once. For several years, from 1994 to 1999, Time magazines housed all of its publications online under the Pathfinder brand and portal, Pathfinder.com. And the Walt Disney Internet Group pulled ESPN.com, ABCNews.com, Disney.com and others into the Go.com portal, with hopes of making the users of one site the users of another. Neither effort won the audience they had hoped for. The individual brands were too strong, and the new overarching brands were too weak to change user habits. Dan Okrent, former AOL Time Warner editor of new media and author of three baseball books, says that MLBAM’s strategy is different from the “wrong-headed” effort he led at Pathfinder. “I don’t see anything inherently wrong with [MLB.com’s plan],” Okrent says. “If you’re a Red Sox fan and look at the American League East standings, then you’ve bought into the concept of the league and Major League Baseball. With Pathfinder, we were trying to force consumer behavior, which you already know is something that you cannot do.”

SHARING THE SHILLINGS

Baseball’s great experiment is, in fact, winning over fans—and that traffic is an important measure of its success. According to Nielsen/NetRatings, MLB.com has ranked among the top 10 sports sites since April and is drawing about 1 million unique visitors per week. According to MLBAM, MLB.com registered more than 108 million page views in June. But a better measure, the one that Major League Baseball owners are most interested in, is revenue. And that is coming along too. Bowman expects to sell about 1 million tickets online this season, generating between \$5 million to \$10 million in revenue. And merchandise through its shop and auction sites should generate another \$5 million and \$10 million this year as well. MLBAM has also signed a deal with RealNetworks, mak-

ing it the exclusive format of audio for the site, in return for a minimum of \$20 million over the next three years. Sponsorships have been signed with MasterCard and the Marriott Vacation Club.

“E-commerce and sponsorships will ramp up very quickly and then settle into a more normalized growth pattern,” says Bowman. “Once you create a new entity with immediate opportunities for sponsorships, it should ramp up very quickly. The same with e-commerce. With subscriptions, it will start slower and eventually grow more.”

Subscriptions, Bowman says, will someday be the main source of revenue for MLBAM. By midsummer, MLB.com had approximately 110,000 subscribers to real-time audio reportage of games, which at \$9.95 a head adds up to more than \$1 million in fees. Bowman figures that in five years, as more fans become accustomed to paying for Internet content and MLB.com enhances its product, subscribers will grow to 1 million.

“The notion that the Internet is free was never true, and it is dying a quick death,” says Bowman. “People will start to understand that to get content on the Internet, you’ve got to pay for it—just like every other medium.”

He predicts that the site will see a profit on an operating basis by next season. In three years, he says, the site will generate revenues nearing \$200 million.

Others are less optimistic. Andrew Zimbalist, a professor of economics at Smith College and author of *Baseball and Billions: A Probing Look Inside the Big Business of Our National Pastime*, doubts that the startup can generate enough revenue to save some of the cash-starved teams in the league’s smaller markets. Zimbalist calls Bowman’s estimates “fanciful.”

“I don’t see a lot of potential to generate revenue with the website,” he says. “You might get a modest increase in total revenue, but they’re going to have to do other things. The Web won’t do the trick.”

Bowman is having none of it. His resolve to make MLB.com work, both for the owners and the fans, is unflinching.

“We feel a lot of pressure,” he says. “Between the commissioner and the club owners, there’s an economic incentive to succeed. But we also have to deliver the right content to our fans. Baseball is the kind of thing that keeps coming at you. It’s a six-month march to Bataan that even the most avid fans can’t get to every game, or watch every game on TV. They just can’t. And so the Internet is an alternative, albeit a third alternative to TV and the ballpark. But there’s so much baseball that it becomes a viable alternative.” **CIO**

Jon Surmacz is a Web writer for CIO.com, as well as a human firewall at shortstop. You can reach him at jsurmacz@cio.com.

“THE NOTION THAT THE INTERNET IS FREE WAS NEVER TRUE, AND IT IS DYING A QUICK DEATH.”

—MLBAM CEO BOB BOWMAN

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Case Files: GM North America

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VALUE METHODOLOGY

A spreadsheet-based “dashboard” uses a traffic light metaphor to communicate the status of IT projects underway. Each initiative is rated monthly on four criteria: performance to budget, performance to schedule, delivery of business results and risk. Each project is then assigned a color code for each metric—red, yellow or green—as well as for status for that month overall, and that information is reported to upper management. In addition, numeric values are assigned to color codes for rolling, 12-month views.

THE PLAYERS

DAVID S. CLARKE

Director of IT operations and infrastructure, GM North America

MARK THOMPSON

Director of planning, GM North America Information Technology

CASE ANALYST

DOUGLAS HUBBARD

President, Hubbard Decision Research in Glen Ellyn, Ill.

Red Light, Green Light

A project-tracking “dashboard” tool helps GM North America keep IT projects on the road BY TRACY MAYOR

WITH HUNDREDS OF new IT initiatives rolled out in an average year, GM North America is up to its hubcaps in technology projects. But the venerable car manufacturer is wary of turning project tracking into a project unto itself. The solution: an easy to use, easy to interpret project “dashboard” that uses three signals instantly familiar to anyone who’s ever sat behind the wheel: green light, yellow light, red light.

In 1999, feeling that GM North America lacked a formal, common way to report metrics among workgroups and to management, several members of the IT leadership team developed a handful of instruments designed to track project status. But useful as they were, those reports were still too detailed for senior managers, who wanted only to keep an eye on the progress of projects many levels below them.

“When you get higher in management, your questions are more about the overall health of a project, not the details,” explains David S.

Clarke, director of IT operations and infrastructure for GM North America in Detroit. “As we were reporting on projects to upper management, we found that we were giving them a view that was too detailed and not consolidated enough.”

So a group of leaders from the CIO’s project management office set to work developing a dashboard that color-codes the status of all IT projects: green when it’s progressing as planned, yellow when at least one key target has been missed, red when the project is significantly—even if just temporarily—behind. “The dashboard is a signaling method; it’s a way to send a message fast,” Clarke says.

From inception, each and every project is tracked and rated monthly on four dashboard criteria: performance to budget, performance to schedule, delivery of business results and risk. The individual measures and triggers used to track the status of those four criteria are deter-



PHOTO BY DWIGHT CENDROWSKI

mined at the outset of the project by the project manager, a planning manager and other relevant executives.

Each of the four categories is then assigned a color status each month by the project manager after he reviews that category's relevant measures. Finally, the overall project is assigned a color for the month. By

design, the technology itself is as simple to use as possible: an Excel spreadsheet and PowerPoint presentation template.

Four-Way Intersection

A few years ago GM North America's mid-size and luxury car unit, or Mid/Lux unit, upgraded from Windows 3.1 to 95. For that

"We were giving management a view that was too detailed and not consolidated enough."

—DAVID S. CLARKE, DIRECTOR OF
I.T. OPERATIONS AND INFRASTRUCTURE,
GM NORTH AMERICA

particular project, the four dashboard criteria were measured as follows.

■ **PERFORMANCE TO BUDGET** was determined by comparing the budgeted per-seat cost of the rollout against the actual costs, which included charges for the contractors to physically install the program, the per-seat cost of the software itself and the cost of training. GM North America had determined previously that it would be cheaper to maintain and support Windows 95 than it had been to maintain Windows 3.1, which meant that the cost of the rollout was expected to go down each month as the savings realized by the new installations accrued. This dividend was built into the budget; therefore, in order to gauge its performance to budget, the Mid/Lux unit needed to track how many seats were deployed each month. Then, if the cost per seat was on or under budget for the month, the rating was green. A certain, predetermined percentage over budget automatically warranted either a yellow or red rating.

■ **PERFORMANCE TO SCHEDULE** was determined by counting the number of seats deployed per month and comparing that to the rollout schedule established at the project's inception. Parameters were ahead of schedule, on schedule or behind schedule.

■ **DELIVERY OF BUSINESS RESULTS** was gauged in this case by looking at two variables: if the rollout was on target to achieve the anticipated cost savings associated with moving to Windows 95, and if the team was

migrating users successfully. The former was measured, as it was in the performance-to-budget criterion, by counting the savings generated by the number of seats deployed per month. The latter—in essence, customer satisfaction—was measured by user surveys and help desk activity, if printer mappings were installed correctly, if shared-driver access was maintained after the upgrade and if new Windows 95 users were able to do at minimum everything they had been able to do previously. While user satisfaction is difficult to measure quantitatively, Clarke says, planning managers tried to stick to hard-and-fast numbers where possible—a certain number of negative responses in the user surveys would automatically require a yellow or red rating, for example.

■ **THE DASHBOARD'S RISK-MITIGATION** measure isn't meant to take the place of a full-blown weighted risk-assessment methodology, which is calculated separately for larger projects. Rather, it serves simply as a way to track potential hazards to a project, explains Clarke, who was chief information officer for the Mid/Lux unit at the time. Project managers identify potential risks at the outset, establish plans to mitigate those risks, then measure each month how well the risk is being controlled. For the Windows 95 rollout in the Mid/Lux unit, the risk was that the core build of the new OS wouldn't be available on time. Parameters were determined by measuring whether Microsoft was meeting its promised delivery targets. Of course, risks can and do surface suddenly midproject. For example, Clarke discovered in the early months of the Windows 95 rollout that the software his team had installed wasn't fully Y2K compliant, which meant that they had to go back and modify the workstations they had already upgraded.

True Colors

Generally a green score overall indicates all four criteria underneath are green as well, though there is some latitude in that judgment. Similarly, if there's red anywhere in the dashboard, it's usually red "on top," or

overall, as well. Yellows and greens are a bit harder to call. "It's discretionary. People will get cute and put in notes saying, This is orange," Clarke says.

And what happens when a project goes red? Dashboard proponents at GM North America have worked hard to educate project managers and team members that red doesn't mean "bad," it means "help." "Red means, I need more money or more people or better business buy-in or a business champion or help with a vendor," Clarke explains. The dashboard provides an early warning system that allows IT managers to identify and correct problems before they become big enough to derail a project.

It's not unusual for projects to show a red month or two—and the dashboard includes a text area where mitigating factors can be mentioned. But three red months in a row is normally the outer limit before intervention is necessary, and on critical projects, a single red can be enough to bring out the troops.

At one point, the Mid/Lux Windows 95 rollout was red simultaneously in three different areas: budget, schedule and risk, Clarke says. The group needed additional funding, additional resources to perform necessary software and hardware upgrades, and additional help with training and migration from a different group within Information Systems & Services (IS&S).

"Presenting that status in not just one meeting but several helped everybody understand the difference between the program we planned and the work that was happening on the front lines," Clarke says. "That red status was a neutral way to communicate that our two groups needed to

VALUATION FLOW CHART

GM North America's dashboard rating process

- **Rank all IT projects on four criteria**—performance to budget, performance to schedule, delivery of business results and risk—using predetermined metrics.
- **Assign a color code to each criterion for each project.**
- **Assign a color code to each project for overall status that month.**
- **Report to upper management.**
- **Assign point values to color codes for rolling, 12-month views.**

work more closely together."

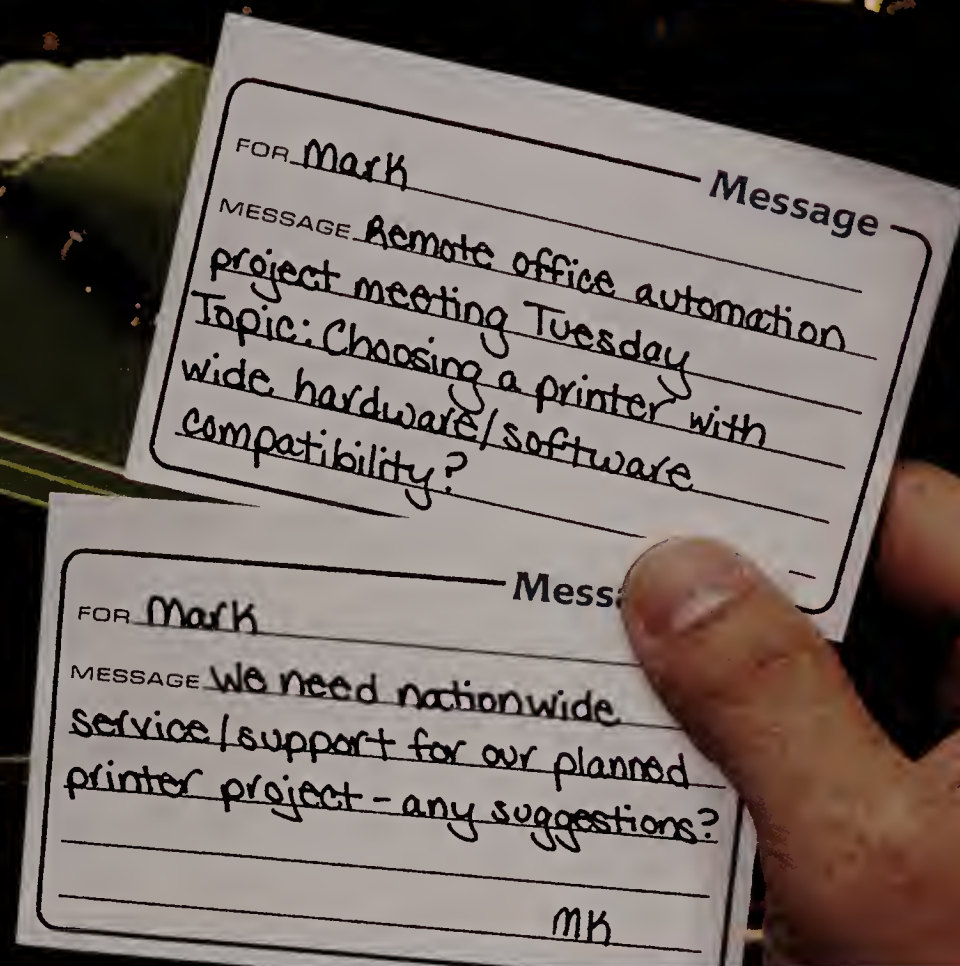
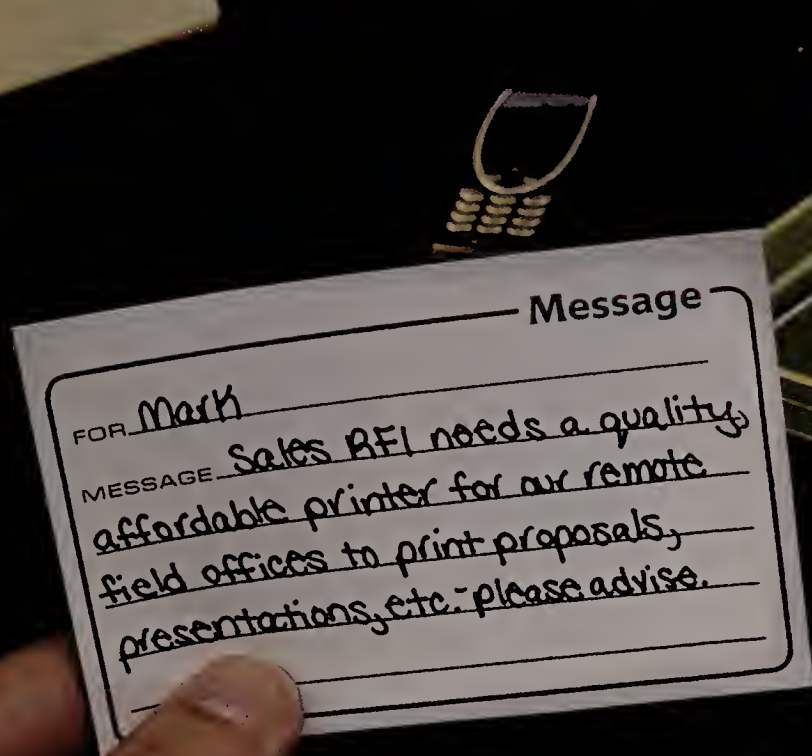
Frequently, red status triggers a corrective action meeting between relevant executives on the project and a CIO from the business-unit level or higher up. Mark Thompson, director of planning for GM North America Information Technology, recalls one case where a project hit a yellow light when a supplier wasn't meeting its delivery schedule. Because the project was considered strategically crucial, GM went into immediate alert mode, with the supplier and other project executives being called into a meeting with the high-ranking CIO for GM North America. "That's one meeting everyone aspires never to be in," says Thompson. "It can be very painful. Let's just say there were some immediate behavior adjustments all the way around."

Give Them What They Need

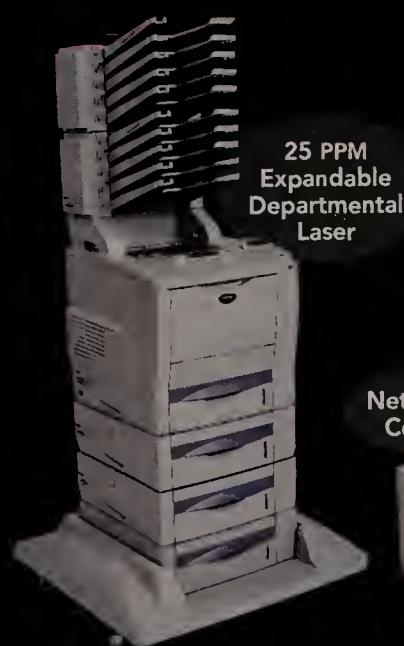
Thompson and Clarke emphasize that the project dashboard succeeds because it's supported by a host of more in-depth reporting mechanisms in the background. In effect, the dashboard is the tip of the iceberg for those times when managers need to see only the tip. If and when they want to see more, they most often turn next to the "4-up report," a one-page, four-quadrant report that gives a detailed synopsis of a project's status by financial, deliverables, milestones and risk activities. And large, complex projects like Y2K are often subject to an additional earned-value evaluation, where points are assigned to each task and a number value,

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obtained at certain milestones, objectively indicates how well the project is performing.

Additionally, a project-approval process that Thompson calls “grueling” weeds out weak project proposals at the outset. And once approved, major initiatives are subjected to additional scrutiny in the form of a project-development methodology—borrowed from systems development—that defines six “toll gates” (planning, definition, design, build, deploy and close) during which performance is gauged and analyzed, according to Thompson. Projects with major flaws would falter at these gates long before their dashboards turned red.

When it comes time to distribute project-tracking assessments obtained with its project dashboard, GM North America’s tool is as flexible as it is simple. An individual project manager might distribute to her immediate supervisors the entire dashboard, with status colors showing for all four categories it measures. By contrast, a report to a business unit CIO or regional CIO summarizing the status of all the projects of a particular business unit would most likely show just a single color per project, with a small text comment when appropriate.

In addition, GM North America’s Process, Integration and Quality Assurance group, which administers the dashboard, assigns point values to colors (green, 2; yellow, -1; and red, -3). That helps maintain rolling, 12-month views of all projects and all operational metrics, such as network downtime and help desk response times, for a given division or business unit. Those reports allow IT to obtain a comparative picture of overall performance over time. “The scores out of context mean nothing. But over the course of a year, it helps us gauge stability,” Clarke says.

GM North America’s IS&S department likes the red-yellow-green dashboard metaphor so much that it uses it to track operations as well. A separate but identical dashboard reports on network performance, Notes availability, help desk satisfaction, delivery of new user PCs and IDs, availability of the company’s GM online Intranet,

lost hours of productivity and so on.

“We started with a separate way to do this, but the conclusion we came to is that we can use the dashboard method to portray both projects and operations,” Clarke says. “Whether we’re sustaining operations or starting something new, we still need to send

a status message, and we all understand the meaning of red-yellow-green.” **CIO**

Have a value methodology you’d like to share and have analyzed? Contact us at casefiles@cio.com. Tracy Mayor is a writer who specializes in business, technology and parenting.

EXPERT ANALYSIS

GIVE REGRESSION A TRY

BY DOUGLAS HUBBARD

GM NORTH AMERICA’S dashboard tool takes an intuitive approach to summarizing large amounts of project status data with a color scheme that everyone understands. I’m sure it goes a long way toward helping upper management keep an eye on projects underway.

The one thing I’d caution is that GM should make sure that the right data is being summarized and represented. Project tracking is, after all, a forecasting problem—the goal is to reliably point out projects that need help (that is, projects whose outlook is poor without help) without bringing undue attention to projects that are getting along just fine. I’m not certain that the four metrics included in GM’s tool forecast problems reliably. Evaluations of business results and risk, in particular, are made fairly subjectively. As a test of the metrics’ predictive power, GM North America might look at historical data for all projects that were consistently coded green in the risk category, for example, and see if more of them were actually successful implementations than those where risk was coded red. If not, the data being summarized isn’t of much use for helping manage project success.

An “actuarial” analysis of GM’s extensive project history might also be useful. A formula could be derived that considers only objective criteria and computes probabilities of potential disasters. Factors such as changes in project management, skill levels of staff, level of sponsorship and number of business units serviced could all be put into a regression model to see if they are correlated to future undesirable outcomes, such as cancellation of the project. This is a practical analysis that has already been implemented at other companies.

Furthermore, with an objective model of risks, GM’s Process group wouldn’t need its system of assigning arbitrary point values to the colors for its 12-month views. The color codes are already somewhat arbitrary and subjective, but assigning numbers to them would, in the field of decision theory, be considered an “information destroying” step. That’s because the forecasting ability of this numerical score is probably even worse than the color assignments themselves. A regression method would certainly produce better forecasts. I’m also certain that the size of GM North America’s project portfolio would easily justify the effort to create a more statistically sound approach to project tracking.



Douglas Hubbard is president of Hubbard Decision Research in Glen Ellyn, Ill., and inventor of the applied information economics method for valuing IT projects. He can be reached at dwhubbard@hubbardresearch.com.

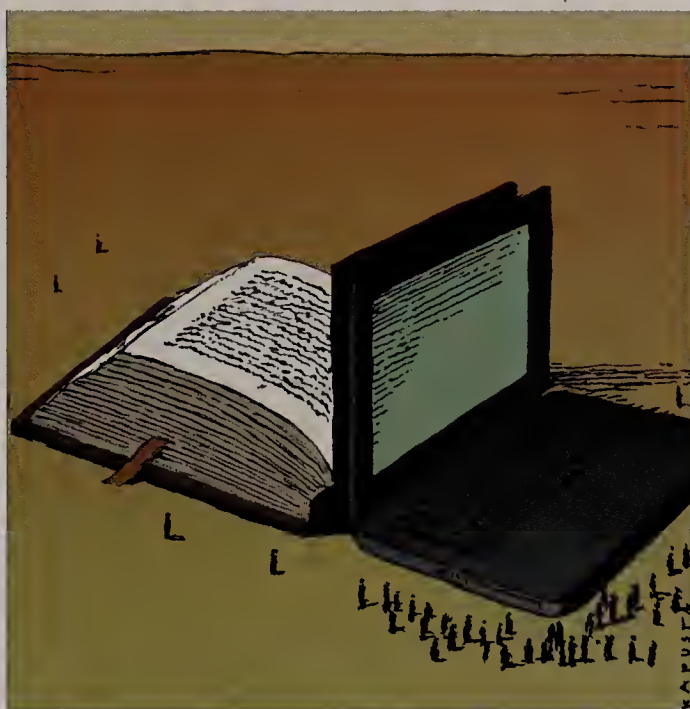
E-Learning: The Secret to Profitability in a Stumbling Economy

WITHIN A SLUGGISH ECONOMY and tough markets, the e-learning sector is still relatively buoyant. Perhaps due to the associations that the sector has built with investment in employee development and

sustainable profitability, or perhaps due to organizations looking to e-learning to reduce costs and “do more with less.” In either case, the future for the e-learning sector still seems pretty bright.

“The outlook is extremely good,” comments Ron Larkin, CEO of X.HLP, an e-learning company with U.S. headquarters in Waltham, Mass. “Although we are noticing some changes in the market.

“About 18 months ago, when companies were doing well, investments in ‘luxury or nice-to-have’ systems were approved with the hope that these would deliver greater returns. As the economy stumbles, an e-learning initiative, like any other investment, is coming under intense investigation. Vendors who do not deliver real and measurable value are quickly being weeded out. Now that every dollar is watched more closely, an interesting transformation has occurred. Companies must do more with less, employee populations are being downsized, and corporations



SOURCE: IMAGES.COM

now see e-learning as an essential part of their business; not just to reduce costs, but to increase profit margins.

“As a consequence, today’s companies are looking beyond the original e-learning paradigms and striving more for ROI justification,” Larkin says. “And rightly so. The old e-learning value proposition, which stressed increasing employee motivation and lowering travel expenses, just isn’t enough these days. Decision makers in companies are now asking ‘What will this do for my bottom line in terms of increased productivity?’ They are looking for significant revenue and profit growth, not just a few dollars in cost savings.”

Larkin adds, “Another reason for

e-learning’s success in today’s economy is its intrinsic links to other profit-focused initiatives. We’re now seeing e-learning cease to be a stand-alone training issue. More and more, companies are adding small, manageable e-learning initiatives to other profit-centric activities such as CRM and ERP application rollouts. E-learning is becoming the most cost-effective and efficient way to accelerate and solidify user adoption of these business-critical applications.”

With increasingly discerning and educated consumers, the e-learning market continues to thrive. As more and more enterprises become acquainted with the potential benefits, the e-learning marketplace appears to be building momentum.

E-Learning Marketplace on the Move

E-learning covers a wide set of applications and processes such as Web-based and computer-based learning, virtual classrooms and digital collaboration, according to the American Society of Training and Development (ASTD). It includes the delivery of content via the Internet, intranets and extranets (over LANs and WANs), audio and videotapes, satellite broadcast, interactive TV, and CD-ROMs.

Every indication shows that e-learning is not only here to stay, but is morphing into a huge market. “Corporate e-learning is one of the fastest growing and, we believe, most promising markets in the education industry,” states W.R. Hambrecht & Co. in its recent report “Corporate E-Learning,



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E-Learning in Action

Shell/Royal Dutch Group of Companies is using e-learning techniques to train more than 30,000 employees in 45 countries in the latest technologies and skills needed in its highly competitive industry.

Exploration and production, the foundation of the petroleum industry, extends from the search for oil or gas to the delivery to the refinery, processing plant or tanker for shipment. To meet its customers' needs, the company strives to develop and train its employees in innovative ways of working and communicating. New technology needs to be introduced into the field and office as quickly as possible. To achieve these objectives, training and retraining are vital, both to create new, more effective ways of working and to facilitate the rapid deployment of new technology.

To meet these challenges, the company's global learning organization has set up a Web-based university—an Internet-based portal for training and education. Using X.HLP technology, it provides interactive, fully supported training to the company's employees around the globe and is helping the organization meet its stated business objectives.

Exploring a New Frontier." While the market is currently relatively small and early-stage, it is poised to explode.

Hambrecht notes that the technological barriers to implementing effective e-learning are diminishing. "The main hurdles to e-learning, such as lack of interactivity, content availability, technology standards and bandwidth, are currently being addressed," the report states. "Especially the continued adoption of broadband should facilitate higher use rates of use-rich e-learning products."

According to Hambrecht, the online training market is expected to just about double in size every year through 2003, when it will reach a healthy \$11.5 billion in worth.

The ASTD is no less sanguine. On average, companies participating in its "State of the Industry Report 2001" study projected a 117 percent increase in the use of learning technologies between 1999 and 2002. ASTD also found that the percentage of organizations using the Internet for training purposes jumped from 3 percent in 1996 to 38 percent in 1999.

But Mark Van Buren, director of research for ASTD, notes a slowing trend in training expenditures in general because of the belt-tightening or cost-cutting in some companies during 1999. Like Larkin, he sees companies looking hard at the justification for setting aside training dollars.

"Training, like any other financial investment, is not immune to changing times," Van Buren says. "Now, more than ever, companies must continually demonstrate the value and worth of their investments in training."

Why E-Learning?

The case for e-learning depends on a simple equation: Good business processes plus skilled people equals profit. To be more specific, e-learning not only increases employee productivity, but because of the interactive and ubiquitous nature of the Web as a delivery system, it dramatically shortens employee time to productivity as well. Not only do these online systems expedite employee productivity, they have also proven to be a mechanism that contributes significantly to

- reducing the cost of doing business
- reducing development timescales
- increasing customer retention through better service and faster support
- enhancing top-line revenue and bottom-line profit.

E-Learning ROI Checklist

If you're thinking about introducing e-learning into your enterprise or if you already have taken the plunge but are not sure of the payback, here are questions that will help you measure your e-learning ROI.

REVENUES—Have you shortened sales cycles because of more qualified product and service knowledge resulting from effective and efficient training content?

CUSTOMER SATISFACTION—Are your employees able to provide quicker, more comprehensive answers to technical questions concerning your products' functionality and associated services?

CUSTOMER RETENTION—Has customer loyalty increased because of improved levels of service and support?

CALL CENTER RESPONSE—Have you in-

creased your customer service representatives' average number of calls by providing the training they need to deal with calls quickly and efficiently?

TRAINING DEVELOPMENT EXPENSE—Have you reduced the cost of training development by enabling your subject-matter experts to create content directly?

COMPETITIVE ADVANTAGE—Are you building your company's value-added proposition by offering integrated training and support to back up your high-tech solutions?

FIELD SALES PRODUCTIVITY—Have you reduced field sales downtime and increased customer-facing opportunities?

EMPLOYEE PRODUCTIVITY—Have your training solutions allowed you to bring your employees quickly up to speed on your specific business processes and applications and accelerate employee time-to-productivity?

BUSINESS PARTNER EDUCATION—Have you reduced time-to-market by educating channel partners on new products and services more quickly and effectively?

Making E-Learning Work for You

Although numerous benefits are associated with implementing e-learning systems, they are not a panacea. E-learning provides a reasonable ROI only when carefully planned and implemented.

For example, suppose you are considering deployment of a CRM application. You'll want to be sure that the application will support your organization's business objectives. In addition, the application should be customizable to fit existing processes and flexible enough to allow for future changes as your company and your marketplace evolves. Your CRM application can become a major element of your competitive arsenal if you implement a training program to help your employees meet business objectives.

But just deciding to implement a training program is no guarantee of success. If your training solutions fall short of the mark, much of the money you have invested in the CRM application might as well have been flushed down the drain. Obviously, your employees have to know how to best use the application in order to maximize its benefits. Effective and timely training turns out to be the largest single factor in driving employee acceptance and efficient use of



the new application. Properly implemented, the investment in training will bring a significant ROI.

Many research groups advise budgeting 15 percent or more of the overall project investment to communications and training. While 15 percent is an arbitrary figure, it does reinforce the idea that a significant commitment to training is essential.

Whether your commitment in training dollars equals 10 percent or 15 percent, e-learning allows you to get more bang for your buck by delivering training efficiently and quickly to a large portion of dispersed users at a much lower cost than more traditional methods, such as onsite classroom teaching.

What's Measured Gets Done

When approaching an e-learning implementation, think of the old and venerable adage in training circles, "What gets measured, gets done."

Identify the precise business objectives you wish to achieve. Are you looking for higher satisfaction ratings from your customers or greater productivity from your employees?

Whatever your goals, your e-learning implementation should support, not conflict, with your overall business objectives. To make sure that you will achieve the desired results, you need to measure outcomes—the actual results.

For example, you might introduce a training program in order to reduce your sales cycles by having your salespeople make fewer calls to nail down each order. You may also wish to generate more prospect leads and a higher percentage of repeat orders. To be sure that you are going to achieve the desired results, plan to collect, analyze, report and review the performance of your employees against your original business objectives as they move through the training process.

Because setting up a training objective is always based on successive approximations, you should use an approach to lesson creation and deployment that allows you to make changes to course content as needed based on the gap between desired and actual employee performance. This on-the-fly restructuring of an e-learning program presupposes using training technology that is flexible, easily modified and preferably under your control.

The Blended Approach

Although e-learning via the Web has proven to be successful, even more effective knowledge transfer is achieved through what's called a blended approach in training jargon. All this means is that the electronic, Internet-based modules are augmented by a mix of good, old-fashioned methods that feature face-to-face learning and personal interaction, such as classroom sessions and on-the-job training. Personal interaction also makes possible the application of another teaching maxim that dates back to the dawn of history—"Tell them what you're going to tell them. Tell them. And then tell them what you just told them."

The blended approach also includes other modern modalities such as distance learning, desktop support in the classroom, instant access to training content after classes are finished and enhanced help-desk-style support when back on the job. The key to mixing and matching these various approaches to training is to identify those that are best handled by e-learning technology and those that can be maximized most effectively using more traditional approaches.

Because rapid ROI is a key goal, the cost of various approaches should be carefully considered. The following chart, based on information gathered by an X.HLP client, indicates the comparative costs of training based on classroom, Web and CD-ROM instructional methods.

X.HLP CEO Larkin notes that the blended approach to training works best when a "teach, show, try, test and support" methodology is the scaffolding upon which you build measurable, effective knowledge transfer. This five-step methodology includes the initial tutorials on theory and use of the application (teach), a guided tour of the application (show) and user participation (try).

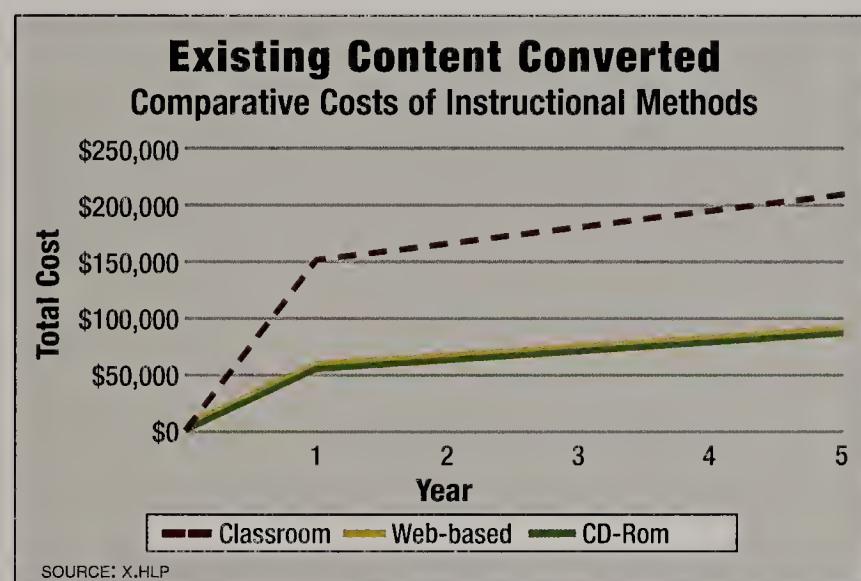
"Support should be part of the training experience during every phase of the learning curve, including post-training support when the users are back on the job," he adds. "Equally important is testing, espe-

cially during the pilot phase. Testing will tell you if your learners are having difficulty absorbing the material. If the e-learning vehicle is flexible and adaptive, the course can be modified on the spot to achieve maximum knowledge transfer."

Flexible E-Learning

There are a variety of approaches to implementing an e-learning program, some more flexible than others. At one extreme, there are monolithic, inflexible training packages offered by a vendor support services group or an ERP company—packages that can only be modified with the expenditure of large amounts of money and time. Because of the inflexibility of this approach, you lose one of the major advantages inherent in new e-learning tools.

Another approach is to hire a consultancy to build your e-learning training package from scratch. The results should be highly effective and tailored precisely to your immediate needs. However, the price tag may send you reeling. And with either of these two approaches, when you have the inevitable staff turnover or your appli-



An X.HLP customer compares the total cost of ownership of traditional classroom instruction versus X.HLP Web and CD delivered content for just a single e-learning project for 200 employees.

cations and your company evolve and change, you may find yourself having to invite the support services group or the consultants back to update the materials—a time-consuming and expensive process.

There is another option. New tools exist that allow you to capture your unique business processes and applications and turn them into e-learning instructional materials that will engage your employees, trading partners and customers. The most recent platforms do



E-Learning in Action

Fleet Boston Financial, the seventh-largest financial services holding company in the United States, is a \$200 billion diversified financial services company, offering a comprehensive array of innovative financial solutions to 20 million customers in more than 20 countries and territories.

Fleet is totally committed to helping small businesses prosper. With that in mind, Fleet's Small Business Services is using CRM tools to assist the field sales force in understanding and meeting broad customer needs in a more comprehensive way than just providing traditional bank products, such as loans and deposits. For example, analyzing the number of employees and payment volumes can indicate whether payroll services or credit card processing are a good fit for a given customer.

Fleet's Small Business Services approach to CRM technology has been to start with a basic system, and add functionality incrementally, so that end users can grow with the system. The training related to enhancements has been a challenge from the standpoint that there is typically not enough new information to pull salespeople in from the field to hold an in-person class, not to mention the cost of classroom training. Further, stand-alone job aids have not been found to be sufficiently effective in transferring this knowledge to the field. Fleet is using e-learning to bridge the gap for enhancement training, and the company also sees the benefit of having interactive reference material versus conventional reference guides.

not require expert programmers—the powerful, object-oriented engines that power these training solutions allow subject matter experts to easily edit, modify and expand materials based on feedback from your pilot group and your company's changing business needs. All the information gathered is held in a central repository, reproduced and turned into e-learning materials based on the five step methodology described on this page.

X.HLP, for example, has developed the X.HLP Adaptive Learning Platform for the effective capture and transformation of knowledge throughout the organization.

"Instead of providing the fish, we're providing the fishing rod," says Larkin. "With the platform's X.HLP Designer component, you can create usable, deployable, customized content in 48 hours or less. Without getting bogged down in programming, your subject-matter experts are able to capture and cascade their knowledge to your target audience—whether it's your employees, customers, vendors or trading partners.

"The software produces support materials for every stage of the learning cycle, including classroom tutorials, performance checks, on-demand help and call center assistance," he continues. "Your employees and other end users can learn the particular process or application at their own pace. Interactive simulations

direct them through each step. It's a whole new approach to e-learning.

"X.HLP typically spends two days at a company's site providing initial training and content development assistance," Larkin says. "About two hours are spent familiarizing the people who will be using the platform with its operation. For the rest of the 48 hours, X.HLP assists the organization in building its first pieces of actual training content, which can then be deployed and implemented.

"The actual functionality of the X.HLP platform is very intuitive," Larkin says. "You can create content on the fly—it's all drag and drop. No more spending hours using old methods like screen camera technology or 'print screen, paste and save.' Instead you easily capture a series of screen images, create new menus and store everything as highly compressed files. You can then manipulate each screen and create interactive hot spots, which can be annotated with explanatory text. You can output your content as a simulation, a practice session, a test or a post-training support aid. Finally you decide what method you want to use to deploy your newly created lesson—CD-ROM, LAN, WAN, Internet or intranet. Within a very short time you can create a new training application, annotate it and send it out to thousands of employees. Updating and deploying the revised application is just as easy."

Five Steps to E-Learning

"From the outset, organizations should look to support individuals in the classroom, on the desktop and in the call center," adds Larkin. "With our platform, organizations can leverage a single entry of content to produce multiple outputs that reflect the basic five-step methodology."

1 Teach—X.HLP Tutor provides the context and rationale for the learning that is about to take place.

2 Show—X.HLP Lessons show the learner the details of the application or process, together with annotations and explanations of the required steps needed to complete the task.

3 Try—X.HLP Simulations allow learners to actually perform the exact task that is required.

4 Test—X.HLP Tests provide the learners with an opportunity to use the knowledge they have obtained and gives you valuable feedback to measure performance against business objectives.

5 Support—X.HLP Guides are mini simulations that provide an interactive form of post-training support. Additional support is provided on a full-circle basis—from the classroom to the help desk.

Focus on Business

According to Larkin, this new approach to learning focuses on business issues rather than just teaching or learning techniques.

"In today's fast-moving marketplace, you can count on every teaching and learning situation to not only be different but constantly changing over time," he said. "That's why an adaptive, highly flexible approach to e-learning and all training is so necessary. And by enhancing your employees' skills, you leverage their ability to be more productive and profitable. Finally, we all agree that expediency is a valuable commodity in a time-pressured economy. If you can create and deploy effective, high-quality, immediately usable knowledge content throughout your organization within 48 hours or less, your odds of beating your competition become a lot better." •

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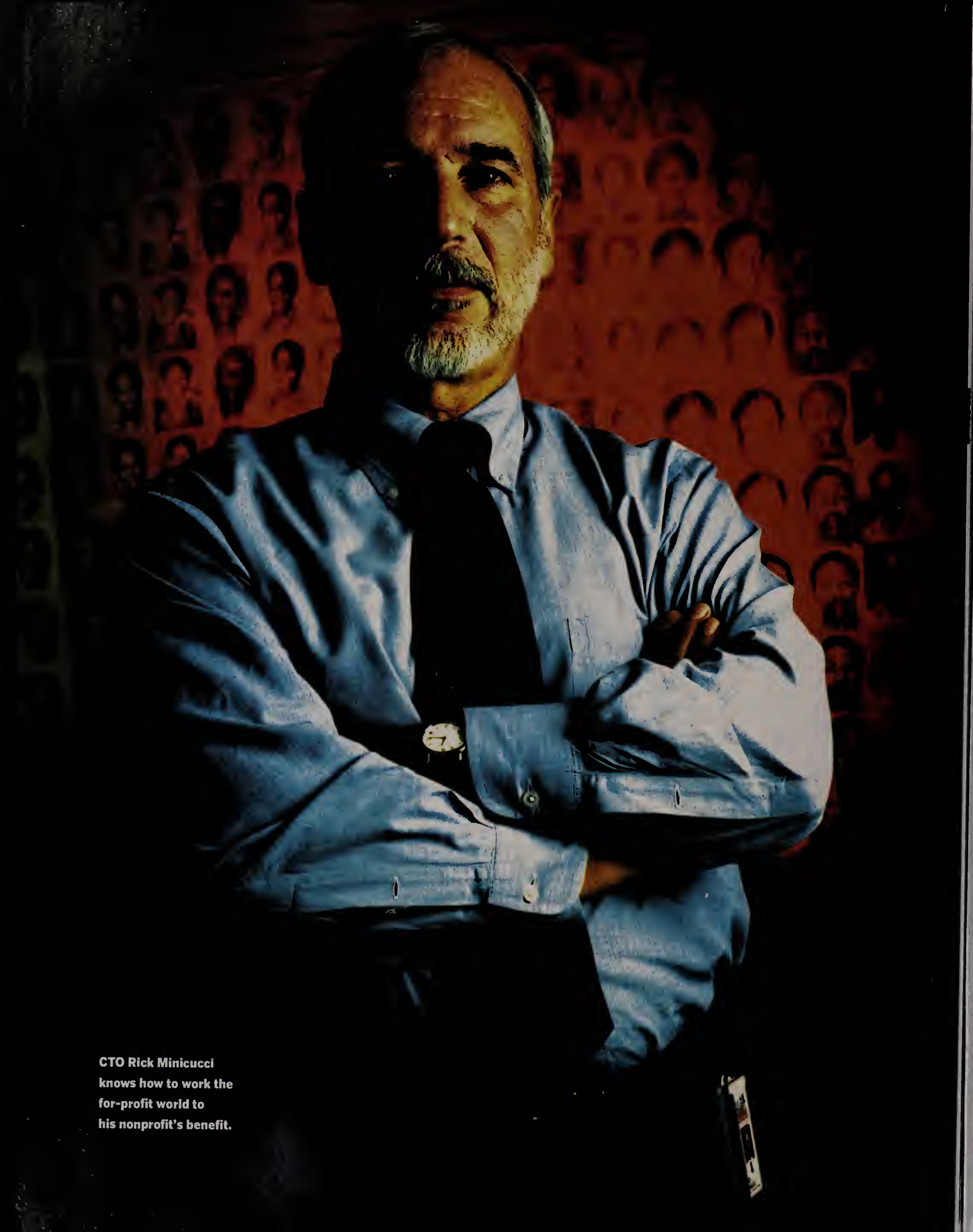
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CTO Rick Minicucci
knows how to work the
for-profit world to
his nonprofit's benefit.

How to Beg, Borrow and Twist Arms for a Good Cause

PHOTOGRAPHY BY CURTIS BOGGS

Rick Minicucci knew it would take world-class technology to make the financially strapped National Center for Missing and Exploited Children a success. Here's how he got it.

BY LAUREN CAPOTOSTO

Fourteen-month-old Anna (not her real name) was kidnapped from her San Diego home early one morning in 1990. Sixty police officers searched door-to-door, aided by dogs and helicopters. They turned up no trace of the little girl.

Seven years later, police in Puerto Rico arrested a woman for child abuse. Questioned about the girl she claimed was her daughter, the woman produced a fake birth certificate. That led police to check the online database maintained by the National Center for Missing and Exploited Children (NCMEC) in Alexandria, Va. There they found a photo of Anna, and even though it was 7 years old, police recognized a birthmark on her face. DNA testing later proved that they had finally found the missing girl.

Credit for cracking this case can be shared by IT—and by Rick Minicucci, CTO of NCMEC. Since coming to the 17-year-old organization in 1996, Minicucci has helped transform the nonprofit from an IT have-not (with a case resolution rate in 1989 of only 60 percent) to a technologically advanced organiza-

Reader ROI

- ▶ Learn what a smart CIO can do with donated equipment
- ▶ Discover the highly profitable benefits to working with nonprofits

Nonprofit Organizations

tion (with a 90 percent success rate today).

With an IT staff of just 10 and a budget contingent each year on federal dollars and charity, Minicucci depends on partnerships to make IT happen. And when it comes to making those partnerships work for both parties, Minicucci has the magic touch.

Minicucci doesn't settle for corporate castoffs. He asks for the best technology and gets it. The proof:

- A first-class website (www.missingkids.org), hosting a database of more than 2,200 children, built by Computer Associates (CA) International and run on Sun Microsystems servers.
- The CyberTipline (www.missingkids.org/cybertip), which can accept thousands of reports each month, was engineered by CA and Sun staffers and also runs on Sun servers.
- A 12-nation online network was developed with assistance from CA.
- Laser printers and scanners from Canon, Compaq and Hewlett-Packard can create a poster of a missing child in minutes. (NCMEC has reported that one out of six children is found when someone recognizes a picture.)
- A safety program (www.netsmartz.com) aimed at kids is the result of \$1.5 million in donated equipment from Compaq, including 3-D workstations and media servers.

Today, NCMEC is as much an IT powerhouse as it is a clearinghouse for missing children. But it wasn't always so.

Anybody Here Know How to Open a Word Document?

NCMEC was founded in 1984 by *America's Most Wanted* Host John Walsh and his wife, Réve, whose child Adam was kidnapped and murdered in 1981. Today the center is the nation's official resource on young runaways and children who have been kidnapped, as well as children who have been sexually exploited through prostitution, pornography or on the Internet. Inside its five-story headquarters on a street heavy with nonprofit associations in downtown Alexandria, some of the rooms and spaces are named after children who were killed by

assists police efforts by prioritizing leads, disseminating information and analyzing data.

Just five years ago, IT played an inconsequential role in NCMEC's efforts. Half the staff worked on a few donated 486 green-screen computers. Less than half stayed connected through a frequently crashing 1 megabit network. Opening Word documents posed a challenge. Case managers and analysts had to search through five databases for information. With no in-house poster-creation capability, NCMEC outsourced the crucial job to a local printer, a process that took up to two weeks.

Minicucci, now 53, walked into this tech-challenged environment as a volunteer in 1989. At the time, Minicucci, who owned a computer imaging and 3-D graphics company, was developing a mug shot system for

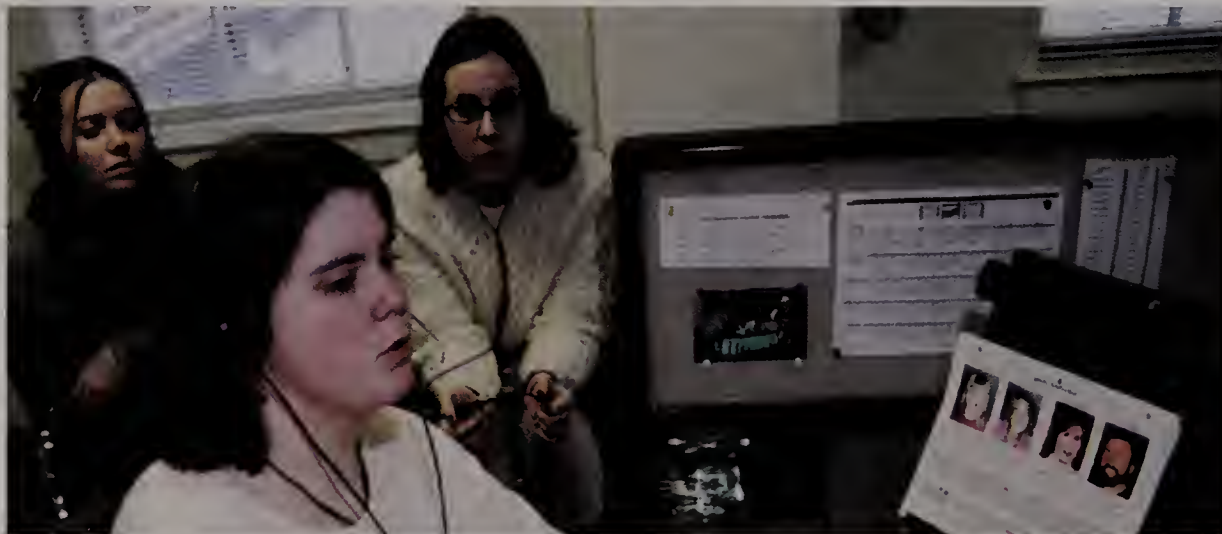
Today, NCMEC is as much an IT powerhouse as it is a clearinghouse for missing children.

abductors, reminding the 166 staffers of their mission. Noise levels are low; concentration is high. Workers refer to cases by the child's full name, not by numbers. Everyone has a favorite recovery story. Although NCMEC does not investigate crimes (that's left to the FBI and local law enforcement), it educates the public about child safety and

the FBI. FBI Special Services Agent Horace Hefner, volunteering for NCMEC, asked Minicucci to modify the work he was doing into age-progression software for the center. Minicucci, a father of two, developed the software pro bono.

In 1994, Minicucci sold his company in search of more fulfilling work. "My

The National Center for Missing and Exploited Children (NCMEC) runs smoothly on the workflows devised by Rick Minicucci. Staffers (below, left) such as Communications Specialist **Alison Feigh** (center) and trainees **Claire Ellis** (left) and **Nellie Dunn** (right) can update the shared database of cases. Volunteer **Jim Lamb** (below, right) in the photo distribution department can run an Internet search to target stores in a city where he can send posters.



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feelings in business were not satisfying," he says. "The process itself was misery. But when I was here [at NCMEC], it was a joy." The first case he worked on got him hooked. A 4-year-old girl was kidnapped from Fairfax County, Va., not far from his own home. Minicucci took family videos and created posters. The little girl hasn't been found, but Minicucci discovered the sense of purpose he had been looking for. "After I would come back from NCMEC, I would always be bubbling with stories," he says. "So when I retired, my wife said, 'Why don't you just do that for the rest of your life.'"

Ernie Allen, president of NCMEC, wasn't looking for a technology officer, but when Minicucci asked him for a job in 1996, he seized the opportunity. Allen had known Minicucci since he first volunteered, and he readily attributes the recovery of 100 children to Minicucci's age-progression software.

Minicucci was hired as CTO (a title he chose) and set about creating a strategic technology plan. With his characteristically optimistic attitude, Minicucci devised part one of the plan: Build a website. "Back then, all the organization did was disseminate information, and I knew what better way to do *that* than to develop a website," he says. But for all his lofty plans, Minicucci had an IT budget of only \$327,000, which included the value of donated goods. If he wanted a database-driven website, he needed to make friends in high IT places.

Not a Charity Case

When approaching the IT elite, Minicucci's strategy is to present NCMEC less as a charity case and more as a business partner. While he doesn't promise monetary returns for corporate investments, he does guarantee ROI: good PR and tax relief. "I think [the partners] actually get [benefits] more than we do," says Minicucci. "If you think about the cost to get good PR versus the cost of engineering or equipment, it would cost a lot more for them to get their end of the bargain."

Once he closes a deal, Minicucci knows

how to manage his relationships with his partners. He doesn't target competitors for similar donations. He allows his partners to use the center for customer referrals. For his biggest partners, he's even thrown in an extra bonus—a demo center on the third floor of NCMEC where partners can take potential clients to showcase products.

This approach has empowered Minicucci to demand more than hand-me-downs. Corey Weinstein, senior consultant of the San Francisco-based nonprofit consultancy AnnSwers, says receiving junked computers has been a universal problem for nonprofits. "While it was great that people were

something useful. "You're never going to turn anything down completely," he says. "You're going to say that something doesn't fit. 'But if you really want to help, these are our problems. Do you think you can help us?'" That approach earned NCMEC 30,000 promotional CDs, which Minicucci distributed to other potential partners.

Stories of missing children, Minicucci admits, are an easy sell. So much so that vendors often approach NCMEC to help. It's then up to Minicucci to identify the partner's role. Before he joined NCMEC, Sun Microsystems offered to help, but no one on staff knew what to do with the offer. "All [NCMEC] knew was that they wanted a website, but they had no idea

NCMEC by the Numbers

Active cases in 1996:	4,907	Today:	5,800
Recoveries in total by 1996:	4,506	Today:	55,322
Posters created in 1996:	460	2000:	1,400
Website hits per day in 1997:	440,000	Today:	2.8 million
Leads reported via CyberTipline in 1998:	4,560	2000:	19,245

interested in helping, on some level the old computers were more of a burden for the nonprofit," says Weinstein.

Minicucci did something even more radical than turning down junk: He rejected high-quality technologies that didn't fit his strategic plan. "That was a smart move," says Weinstein. "The key is to develop a long-range plan and figure out how a company can help an organization meet its goals."

One company Minicucci turned away wanted to donate a system that could put digital pictures of missing children on a CD. "That's truly a bad way to distribute pictures," says Minicucci. Parents want pictures of their children removed as soon as the children are recovered, and it would be impossible to do that on released CDs. Instead, Minicucci challenged the company to give him

what they wanted the website to look like," says Chaz Chastain, global business development manager for Sun's criminal justice operations. "They didn't know what they wanted it to do."

Minicucci knew exactly what he wanted from Sun: a server to run the website. He got it. But technology alone wasn't enough to complete his vision; he also needed staffing. So Minicucci leveraged NCMEC's existing relationship with CA to build the website. At the time, CA had donated only some software and its enterprise management solution, but Minicucci soon had CA staffers on the phone for as much as six hours a day helping him build the site. "We're always looking for ways to get partners to give us more," he says, with his usual easy laugh.



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Working with **NONPROFITS**: A guide for CIOs

Thinking of doing good with your IT? Here are some pointers to make your nonprofit relationship profitable.

KNOW THE MISSION. If you really want to help, you need to know the nonprofit's mission. Then determine which of your technologies or services best provides a means to achieving the organization's goals.

THINK LIKE A SHAREHOLDER. If your company invests in a nonprofit, make sure the organization meets its goals. "We expect them to accomplish what they set out to accomplish," says Ryan Robinson, vice president of community relations for Compaq. "We want to make sure that its objectives are met as any shareholder of a company would."

BE CLEAR ON THE TIME COMMITMENT. If your company is donating equipment, plan to be involved with the nonprofit for the long haul.

COMMUNICATE YOUR NEEDS. There's an ROI to do-gooding beyond warm and fuzzy feelings. As you determine your level of involvement in a project, communicate exactly what you want in return from the nonprofit. "It is important that an organization is very sensitive to PR needs and communication," says Robinson. "Setting up clear expectations in the beginning is important."

—L.C.

Susannah Schaefer, special assistant to CA Chairman and NCMEC Board Member Charles B. Wang, says technical assistance is just as important as donated technologies. "When Computer Associates first started working with NCMEC, the national center's IT staff was minimal," she says. "CA's donation wasn't just to ship them software but to install and implement it as well as to provide training to their staff."

Soliciting donated help isn't always easy. It's one thing to ask for hardware, quite another to ask for personnel. Sun's Chastain says, "If you donate equipment or money, marketing understands that. But it's a hard sell to tell the marketing department that you're donating people. When you're for-profit, the reality is that you could get top dollar for your experts." But Sun has given NCMEC hundreds of free and discounted engineering hours.

Minicucci understands the value of quid

pro quo too, so in return for donated time, he gives his time. He regularly attends vendor-run conferences to explain how a company's products perform mission-critical functions—in NCMEC's case, saving children. Vendors give the time and money; Minicucci helps sway potential customers.

So far, Minicucci has leveraged tight partnerships with a group he considers the Big Three: CA, Compaq and Sun. The strength of these partnerships is apparent in the center's IT budget, which has increased nearly nine times from 1996—to \$2.8 million (including donated technologies). During the past five years, Minicucci has brought in \$10 million worth of products and about 4,000 donated hours.

The Hard and the Soft of It

A walk through NCMEC's Alexandria headquarters—purchased with a \$5 million grant from CA in 1999—reveals the fruits of Minicucci's labors. Case managers access more than 200 fields of data from a CA Ingres II database—a relational database server CA typically uses in e-business—supported by database drivers from Merant, a software vendor from Rockville, Md. Workers in the exploited child unit examine leads of child pornography that come in through the website's CyberTipline, pow-

ered by donated Sun Solaris servers and a Unicenter TNG enterprise management system from CA. Donated CA staffers and discounted helpers from Sun recently engineered an upgraded tip line that can handle four times its original capacity. Merant has also donated its data integration software, and Resonate, an e-business software vendor from Sunnyvale, Calif., provided traffic management software.

Donated databases and servers perform the same functions they would in any for-profit business, but donated staffers feel the joy that Minicucci did when he first volunteered 12 years ago.

"I think people are interested in helping for the same reasons I was," he says. He also knows how work at NCMEC can affect the helpers when they go home. Dan Curtian, a project manager for CA, spent several months improving the CyberTipline. "As the father of a 5-year-old, it was very disturbing to think something could happen to my daughter," he says. "I share my experiences at NCMEC with my daughter. At night, if she knows I am working for the missing kids, she has a better understanding of why daddy is busy." 

Do you have your own techniques for working partnerships? Send us your ideas at letters@cio.com.

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Read more about nonprofits in the **CIO EXECUTIVE RESEARCH CENTER** at www.cio.com/executive. For related articles, check out www.cio.com/printlinks.

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DIFFERENT Voices SHARED Visions

GETTING ALIGNMENT RIGHT

TIMES OF ECONOMIC UNCERTAINTY are also times of great opportunity. They force us to rethink our strategies and visions, to re-examine how we deploy our resources, and to jettison marginal areas of the business and focus on those contributing most to the bottom line. It's often during this rethinking process that we hit upon new ways of working together that in turn create irraginative, breakthrough models.

Success will only come when different voices embrace shared visions. These efforts require solid strategies, clear prioritization, the understanding and buy-in from traditional and e-business units, and the right infrastructure and resources in place to support it all.

DIFFERENT VOICES/SHARED VISIONS: GETTING ALIGNMENT RIGHT, October 14 - 16, 2001 at The Westin Mission Hills Resort in Rancho Mirage, CA, lets senior technology and business executives strengthen the bonds between them and share new approaches. Our presenters are drawn from the ranks of senior executives who are finding new ways of energizing and mobilizing IT and business units. They are forming shared visions that create new value, a higher ROI, and more strategic deployment of technology.

This October also marks a special milestone: our 25th *CIO Perspectives*® conference. Do plan to join us, and add your voice to the vision.



Agenda

SUNDAY, OCTOBER 14 – TUESDAY, OCTOBER 16, 2001

Sunday, October 14

8:30 AM - 1:30 PM

Golf Tournament at the Gary Player Course

Hosted by Lockheed Martin Global Telecommunications

2:00 PM - 5:00 PM

Registration

6:00 PM - 8:00 PM

Welcome Reception

8:00 PM - 10:00 PM

Evening @ The Improv

Hosted by Information Builders, Inc.

Back by popular demand! Information Builders again treats us to an evening of hilarity with performers from the world-famous Improv Comedy Club in LA.

Monday, October 15

7:15 AM - 8:15 AM

Breakfast & Informal Roundtable Discussions

8:15 AM - 8:30 AM

Welcome & Opening Remarks



Gary Beach

Group Publisher
CXO Media Inc.

8:30 AM - 9:15 AM

Aligning Clicks and Bricks Strategies



Moderator: Dr. Jim Wetherbe

Professor of IT, Texas Tech University

Organizations are having to make critical, strategic decisions on how to position their Internet strategies with their traditional brick and mortar business. Similarly, organizations that were primarily Internet businesses are having to grapple with brick and mortar support strategies. The most important issue is how and why customers are choosing between click versus brick as they make purchases. Wetherbe presents research results from the newly-founded Institute for Internet Buyer Behavior to help organizations align their click efforts with their brick efforts to achieve the best results from the marketplace.

9:15 AM - 10:15 AM

Developing Relationships that Grow the Business



J. Brian Ferguson

President, Chemicals Group, Eastman Chemical Company

Roger K. Mowen

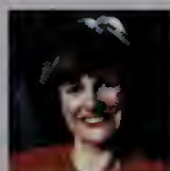
Vice President, Global Customer Services Group and CIO, Eastman Chemical Company



Eastman Chemical Company has undergone a transformation – changing the way it and the chemical industry does business. With a four-point e-business strategy as its guide, the company has implemented, and invested in, new technologies and Internet capabilities designed with one purpose in mind – make it easier for customers to do business with Eastman. This transformation did not happen overnight. It took vision, commitment and leadership from the CEO down to managers at the operational level. Brian Ferguson and Roger Mowen discuss the company's e-business strategy and how they worked together to achieve a common goal – turn an old-line chemical company into a quick, nimble e-business leader committed to the needs of its customers.

10:15 AM - 11:00 AM

Business & Technology: A Strategy for Staying in Sync



Andrea Anania

Senior Vice President and CIO, Cigna Corp.

Today's fast-paced e-business marketplace has made it more important than ever for business and technology leaders to be on the same page when it comes to investing in and using technology to achieve business objectives. This presentation describes a smart strategy for ensuring that all the business and technology basics are covered while exploiting everything e-commerce has to offer today's evolving companies.

Coffee Break 11:00 AM - 11:30 AM

Business Briefings/Case Studies 11:30 AM - 12:15 PM

Business Briefings/Case Studies 12:25 PM - 1:10 PM

Working Lunch 1:15 PM - 2:45 PM
Dr. Rick Brinkman



Co-author: *Dealing With People You Can't Stand – How to Bring Out the Best in People at Their Worst*

Do you work with people who waffle about decisions? Or who try to intimidate you? Or who constantly say "That won't work," or "It's not my fault?" Dr. Rick uses both wit and wisdom to identify the ten types of difficult people we all have to deal with – and shares proven strategies for getting positive results from these hard-to-handle colleagues. (Will you recognize your CEO, CFO, VP of Human Resources – or even yourself?)

Business Briefings/Case Studies 2:45 PM - 3:30 PM

Where Should eCommerce Live within the Hierarchy of an Enterprise? 3:30 PM - 4:30 PM

Janey A. Place, PhD

Executive Vice President, eCommerce Strategy, Mellon Financial Corp.



CTOs and CIOs are being charged with making costly and critical business decisions, but where is the majority of the value being added and what strategies will maximize that value? How can organizations balance IT expertise and business expertise in developing an e-commerce strategy and what role does the IT department play in that? With IT departments as large as 2700 people, how do you get everyone to understand, accept and begin acting in a new role with the speed that is now required by customers?

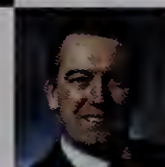
Co-evolving Business & IT Strategies 4:30 PM - 5:30 PM

Robert M. Cohen

Vice President, Information Services and CIO, AstraZeneca

James Pusey, MD

Vice President, Marketing, AstraZeneca



Often in IT, we speak of aligning IT strategy with business strategy. While alignment is important, one of the most successful IT strategies is defined when IT and business strategy mutually shape each other. Cohen and Pusey discuss the difference between strategy alignment and co-evolved strategy, the process for getting there, the prerequisites, the benefits, and personal experiences of lessons learned and successes.

Networking Reception 5:30 PM - 7:00 PM

Hospitalities 7:00 PM - 11:00 PM

Tuesday, October 16

Breakfast & Informal Roundtable Discussions 7:30 AM - 8:15 AM

Day Two Welcome 8:15 AM - 8:30 AM

Moderator: Dr. Jim Wetherbe

Winning the Talent Wars 8:30 AM - 9:30 AM

Bruce Tulgan

Founder, RainmakerThinking



There's been a fundamental shift in the employer-employee relationship: from the rigid, pay-your-dues and climb up the ladder model to the fast-moving, increasingly efficient free market for talent. Tulgan shares knowledge gleaned from in-depth and ongoing research on new attitudes of today's workforce, and talks about innovative solutions to align the work we need to get done with the new models.

Agenda

SUNDAY, OCTOBER 14 – TUESDAY, OCTOBER 16, 2001

Tuesday, October 16 (continued)

9:30 AM - 10:30 AM



Best Practices Exchange Panel: Getting It Right

Moderator: **Martha Heller**

Executive Web Editor, *CIO Magazine*

Panelists: **Mark West**

CIO, *Electronic Arts*

Mike Anderson

CIO, *The BISYS Group*

Paul Ingevaldson

Senior Vice President of International and Technology, *Ace Hardware*

It is easy to talk about alignment in general terms, but where do you start? Drawn from the CIO Best Practice Exchange, a private online network of senior IT executives, this panel of CIOs will discuss the real stuff of CIO/CEO collaboration — the tools, metrics, methods, and documents it takes to achieve true IT alignment. Moderated by Martha Heller, director of the Exchange.

10:30 AM - 11:00 AM

Coffee Break

11:00 AM - 11:45 AM

Business Briefings/Case Studies

11:55 AM - 12:40 PM

Business Briefings/Case Studies

12:45 PM - 1:45 PM

Networking Lunch

1:45 PM - 2:30 PM

Dessert & Host Displays and Networking

2:30 PM - 3:45 PM



Special Address: Leading at the Edge

Dennis N.T. Perkins, PhD

President, *The Syncretics Group*

In the chronicles of extraordinary adventures and against-the-odds survival stories, nothing compares to that of Sir Ernest Shackleton and his team of Antarctic explorers. Stranded in the frozen sea for nearly two years, the team endured extreme temperatures, hazardous ice, dwindling food, complete isolation, and perpetual blackness. Perkins, author of *Leading at the Edge: Leadership Lessons from the Extraordinary Saga of Shackleton's Antarctic Expedition*, shares what voices from the past can teach us about a group that remained cohesive, congenial, and mercifully alive despite seemingly insurmountable obstacles.

3:45 PM - 5:30 PM



Closing Keynote: Strategies for Creating New Growth Businesses

Clayton Christensen

Author: *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail*

In *The Innovator's Dilemma*, Christensen discussed why some companies fail or stumble when confronted with changes in technology or markets. What he found was that classically well-managed companies often do not respond to important changes in technologies and markets. They listen very attentively to their customers' needs, watch their competitors closely, invest aggressively in those new products and services that promise the highest profitability — but fail to see what in fact could kill them. Christensen discusses how companies that introduced disruptive technologies toppled the industry leaders, the patterns and strategies these companies developed that helped them achieve a higher probability of success, and what he has learned that can help you topple the leaders in targeted industries today.

5:30 PM - 7:00 PM

Special Reception with Dennis Perkins & Clayton Christensen

7:30 PM - 9:30 PM

The CIO Harvest Moon Dinner

9:30 PM - 11:30 PM

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Don't Hang Up

New technologies make Web teleconferencing worth another look

BY JOHN EDWARDS

Edited by Christopher Lindquist. Send your thoughts and ideas for future columns to et@cio.com.

WHEN SOMEONE calls a meeting at Virginia Polytechnic Institute and State University, it's not unusual to find people rushing past conference rooms as they head to their PCs. During the past couple of years, the Blacks-

burg, Va.-based university has begun shifting many of its business and academic gatherings to the virtual world of Web teleconferencing. "It's a tool we use to broaden participation and provide convenience," says Patricia Jack-

Teleconferencing...Sentient computing...Open systems...NeoCore

son, Virginia Tech's associate vice president of IS and computing. "Why bring everyone to a central location when a videoconference provides the same benefits at a lower cost?"

Virginia Tech isn't the only organization nurturing an interest in teleconferencing. Although teleconferencing has existed in one form or another for more than 30 years, costly equipment, installation and connectivity services have hampered widespread adoption. But a new generation of inexpensive Web-driven teleconferencing technologies, widely available low-price broadband connections and a renewed corporate interest in cost cutting have begun to push teleconferencing into the spotlight.

The market for Web-based teleconferencing services in the United States is projected to skyrocket from \$62 million in 2000 to \$238.6 million in 2003, according to Frost & Sullivan, a technology mar-

ket research company in San Jose, Calif. "When organizations look at what's available today, they realize that teleconferencing has moved beyond being just a supercharged conference call," says David Alexander, a teleconferencing industry analyst at Frost & Sullivan. But Alexander admits that teleconferencing technology is still far from perfect. It remains encumbered by shaky software, lingering bandwidth constraints and unpredictable connections. "But a growing number of firms are beginning to see enough potential in the technology that they're willing to accept the risks in order to reap the benefits," he says.

New Technologies

An array of sophisticated technologies such as streaming video, document sharing and instant messaging—tools that enhance productivity and make online sessions more like a real meeting—have transformed tele-

conferencing. Virginia Tech, for example, gives each of its conference participants Vigo—a self-contained, five-pound teleconferencing system that includes a speaker, a detachable video camera with built-in microphone, a speaker tower, a headset, a USB hub and software. When plugged in to a PC, the \$1,200 unit can transmit real-time video over an IP network. Polycom offers a similar product. The company's ViaVideo is a \$600 USB-based teleconferencing station that supports voice, video and data communication. "These personal devices allow workers to conveniently participate from their own offices rather than a conference room," says Christine Perey, president of Perey Research & Consulting, a teleconferencing market research company in Placerville, Calif.

On the software front, vendors such as CoCreate Software, eRoom Technology, Lotus Development, PlaceWare and SDRC offer products that enable teleconference users, depending on the product, to see and hear each other, swap documents, view graphics, set schedules, track work, chat, create polls, view graphics, play video clips and conduct website tours.

Software is also turning teleconferencing into a 24/7 experience. The instant messaging capabilities offered by Lotus's Sametime, for example, allow users to communicate with colleagues on a PC, Web-enabled PDA or mobile phone before or after a formal teleconference session. A built-in awareness function tells a user when a colleague is present and also describes the individual's specific role, such as a team leader or key specialist.

The increasing availability of broadband connections is also driving teleconferencing's sophisticated new hardware and software technologies. Virginia Tech's interest in teleconferencing was spurred by a deep reservoir of broadband capacity, the result of the school's Internet2 development work. (Internet2 is a project sponsored by more than 200 universities and corporations to create a next-generation Internet.) "With a broadband Internet

Talking Heads

Using an avatar means never having to worry about a bad hair day

AN AVATAR—the Sanskrit word for the incarnation of a god on earth—is an image you select to represent yourself in a teleconference. Avatars can be cartoon characters, photographs or, as in the case of Matrox Graphics' new "head-casting" technology, a photo-realistic animated image.

Available in the company's new Matrox Virtual Presenter software, head-casting lets users create PowerPoint slides narrated by shoulders-up animations of themselves. Each lifelike 3-D persona, driven by the user's own voice, is displayed in high-definition with complete lip-synchronization.

The system requires two photographs of the user's head to create an animated 360-degree model. The technology can be used with dual displays—the presenter on one screen and the slide show on the other. In a single screen setup, the presenter appears inside a resizable window that can be placed anywhere onscreen.

Matrox created the head-casting technology by combining 3-D photo-animation software developed by Digimask with audio-based personal agent technology created by LIPSinc. The software requires a PC running a Matrox Millennium G550 graphics card. The system can run over a 56Kbps Internet connection, although a broadband link will provide more jitter-free animation.

Matrox isn't the only company developing sophisticated avatar technology. Microsoft researchers are working on a way to use a digital camera to scan a PC user's head into a 3-D image. Sophisticated software would then add a full range of facial expressions to the image. Microsoft believes the technology has multiple potential applications in teleconferencing, online customer support, interactive kiosks and role-playing games. —J.E.

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connection, you have a high level of quality, and you don't have to worry about costs as you would with a traditional phone-line connection," Jackson says.

While most organizations can't tap into an Internet2 level of access and transport, a proliferation of affordable office- and home-based DSL, cable, wireless and satellite connections is making streaming video and other bandwidth-hungry teleconferencing technologies practical for just about any organization. "The days when teleconferencing systems had to work within the stringent limits imposed by a 56K world are rapidly fading away," Perey says.

Easier Collaboration

Unlike traditional meetings, which attendees must schedule in advance, teleconferencing gives teams the ability to meet and solve problems on short notice. For Coaching.com, an Escondido, Calif.-based business-skills coaching company, the ability to spontaneously gather geographically distant trainer and students

school to participate in seminars and business meetings. "Distance no longer matters when you can connect someone into a teleconference via the Web," Jackson says. Virginia Tech recently hosted a teleconference between Sen. George Allen (R-Va.) and school officials. The technology allowed Allen, based in Richmond, to discuss research initiatives with Virginia Tech leaders located more than 200 miles away in Blacksburg. "This probably wouldn't have happened if we had demanded that Sen. Allen travel to us," Jackson says.

Off the Road

Although convenience and improved productivity are key teleconferencing benefits, most businesses turn to the technology to slash travel expenses. "The idea that you can tell the airlines to go fly a kite is highly appealing to most companies," Frost & Sullivan's Alexander says.

The lure of substantial travel savings is what attracted Minneapolis-based Honeywell International to teleconferencing. The

A growing number of businesses are urging employees to hold meetings via the Web rather than in person.

means being able to provide a school-like atmosphere without the inconvenience or cost of a physical campus.

Coaching.com is using Clinton, Miss.-based Worldcom's Presentation Assistant teleconferencing service to provide training and support to its coaches worldwide. The technology allows the organization to share presentations, manage online Q&A sessions, poll participants, demonstrate software and conduct Web tours. "Net conferencing gives us an affordable approach that broadens our access while still allowing us to create very impactful experiences," CEO Scott Blanchard says.

Virginia Tech's Jackson notes that teleconferencing enables normally unavailable people to pay a personal visit to the

avionics and control systems manufacturer has a widely dispersed engineering team. "Getting these employees to share information quickly and efficiently is critical," says Richard Hoeg, engineering information services manager. "Getting them to do it at a lower cost is even better."

Honeywell's North American engineers use PlaceWare software to conduct Web-based seminars and internal project collaboration. The group holds at least 20 teleconferences each month. The technology has slashed travel costs—virtually eliminating the need to fly and lodge dozens of engineers for routine meetings at an average cost of about \$1,200 per person. "The savings have justified the cost of the technology," Hoeg says. "But, more important,

Companies to Watch

NeoCore

XML'S ADHERENTS use many glowing adjectives to describe their favorite acronym, but *fast* isn't usually one of them. Now a small company in Colorado Springs, Colo., hopes to make speed and XML synonymous.

NeoCore's XML Management System (XMS) provides a high-performance repository for corporate XML data (be it native or converted by various translation tools), allowing businesses to access their information in one location, rather than querying multiple applications.

It may sound like middleware, but such products can suffer from performance problems. NeoCore accelerates the process with a technology called Digital Pattern Processing (DPP). Rather than doing sequential searches—a process that results in rapidly increasing search times as databases expand—DPP converts data into "icons" that describe the content in the database. XMS then compares icons—up to millions per second—to find a match.

"[NeoCore] brings to XML data serving one thing that was needed for XML data serving to reach its potential: performance," says Dirk Coburn, research director for Java and XML at Framingham, Mass.-based research company IDC (a sister company to CIO's publisher, CXO Media). "It can't be overstated how important that is."

For more information, visit www.neocore.com.

—Christopher Lindquist

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Quirky Time

While interest in teleconferencing is surging, the technology continues to experience growing pains. Most new adopters quickly realize that even after more than four decades of development, teleconferencing remains a quirky, problematic and immature technology.

For Virginia Tech's Jackson, the big problem has been maintaining enough bandwidth to support several users located at multiple locations. At such times, even the abundant pipelines provided by Internet2 aren't sufficient to provide glitch-free performance. "With bandwidth constraints, the picture freezes while the voice keeps going," she says.

Corporate firewalls can be a headache too. "If your security system disables Java, for example, you're dead in the water," says Hoeg. The general shakiness that afflicts most Web applications is also plaguing adopters. "It's usually not a big deal when a Web browser crashes, but losing a teleconference can cause real torment," he says.

Still, despite the problems, there's an emerging consensus that teleconferencing is finally turning the corner. Frost & Sullivan's Alexander believes that the technology is on the verge of becoming routine and that it will soon hit businesses with the same impact as e-mail and fax machines. "Web conferencing is defining the future of business communications," he says.

Virginia Tech, meanwhile, is thinking of new ways to use teleconferencing. Online courses, interactive job recruiting and links to other schools' classrooms are all in the works. "The technology's potential is as unlimited as the number of ways people meet and communicate," says Jackson. "It's giving us a new view on the world."

John Edwards is a freelance technology writer in Gilbert, Ariz. He can be reached at jedwards@john-edwards.com.

UNDER DEVELOPMENT

Smart systems

Omniscient Computing

IF A NEW CONCEPT called sentient computing takes hold, computers, telephones, cameras, software and other everyday technology tools will automatically know who you are, where you are and what you need.

Designed by AT&T Laboratories researchers in Cambridge, England, sentient computing uses a server and common object request broker architecture (CORBA) database software to create precise maps of the places in which people live and work. Using a series of ultrasound radio sensors—called bats—that are attached to devices and people, the system can detect the location and status of objects to within less than an inch throughout a 10,000-square-foot

office. "Each person and object has a defined space with associated characteristics—similar to the way a computer can locate and direct a cursor," says Pete Steggles, an AT&T Labs researcher.

One of sentient computing's most intriguing applications is called the follow-me personal desktop. User-

associated software and data can appear on any screen as employees walk around a building. Another handy application is a telephone system that automatically routes calls to workers based on the closest phone. "With sentient computing, when you leave your desk, you don't have to leave your work behind," Steggles says.

On the multimedia front, a sentient computing system can intelligently select cameras and set angles to track videoconference participants as they move about the office. The technology can also be used to boost IT security. "Regardless of where it is accessed, the system will intrinsically know who created a document and who has the right to view it," Steggles says. On a physical security level, a sentient computing system could automatically lock and unlock doors in accordance with a user's assigned privileges. The technology could also help organizations slash energy costs by turning devices and environmental systems on and off as users enter and leave rooms.

But sentient computing also has its dark side. The technology is bound to attract the ire of privacy advocates, who will view it as yet another tool that employers can use to monitor workers' behavior and productivity. "We're working on a privacy policy statement that we hope will shed some light on this matter," Steggles says.

It doesn't use any exotic hardware or materials, so sentient computing isn't intrinsically expensive. "The main costs are installation and maintenance," Steggles says. AT&T Labs has installed a prototype sentient environment on the Cambridge campus. Steggles expects a "more packaged" version to be ready in about a year. "The biggest challenge will be convincing businesses that this technology is ready for the real world," he says.

—J.E.



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REVISIT

Open systems

Using Unix

Early fears fade into the success of open systems

BY FRED HAPGOOD

AS A RULE, we at *CIO* believe that talented people faced with cutting-edge opportunities should go for them. Occasionally, however, the cutting edge looks a little too sharp and the yellow light goes on. That's what happened when we first took up the topic of open systems ("Getting to Unix," Nov. 15, 1993).

At that time, opening a system meant moving it from a computing environment in which all the pieces—OS, applications and hardware—came from the same vendor to one in which products from several sources were mixed. And such systems usually were organized around Unix. On paper the advantages of open systems were obvious—IT departments gained more control and more efficient use of older equipment. But those advantages had been just as obvious during the previous decade, when the market preferred single-source

systems and their benefits, such as integrated support, guaranteed compatibility and responsive vendor relationships.

But by 1993 something had changed. Managers were increasingly eager to break out of the protected environments that had served them until then. We thought that was a very serious step. We warned against unrealistic deadlines and skimpy budgets, and advised thorough research of vendor finances and technical backgrounds along with the double-checking of product claims. "There is just as much to selecting an open-systems vendor as there is to configuring most mainframe systems," we warned—a frightening observation considering that mainframe configuration would certainly have been one of the labors of Hercules, had Hercules worked in IT.

In retrospect we may have worried too much. The transition to open systems

Wireless

PREDICTIONS

Wireless Upswing

Recent reports by Cahners In-Stat Group (www.instat.com) show that nearly half of the U.S. workforce already has access to wireless devices (ranging from pagers to wireless-enabled PDAs). But while that number will grow in the coming years, it won't grow quickly—nor will the growth come from large companies as much as it will from small organizations.

According to the reports—collectively titled "All Business Is eBusiness: Demand for Mobile Services and Expenditures on Communications Services & Equipment"—by the Scottsdale, Ariz.-based research company, the total number of wireless-using U.S. workers will rise to more than 60 percent by 2004. The reports also state that most of the increase will come from small (less than 100 employees) companies.

The increase in wireless usage will affect budgets as well. The reports note that many customers may purchase new equipment as often as once every year in order to keep up with changing technology. And business spending on wireless devices should increase from \$37 billion in 2001 to nearly \$74 billion in 2005.

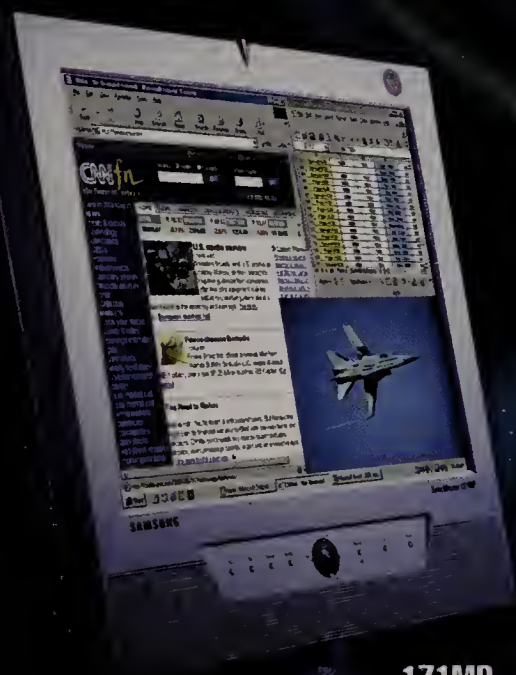
—C.L.



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turned out to be less like having heart surgery and more like going to school on the first day: traumatic, perhaps, but certainly survivable. And managers were destined to get lots of practice. During the 1990s, operating systems, application interfaces and applications themselves would all become steadily more "open," moving to greater standardization and broader access. Operating systems went from Digital Equipment's VMS to Microsoft's Windows NT to—increasingly—Linux. Communications protocols converged on IP. Java became inescapable. Getting to openness turned out to be not a single step but a lifelong process.

One reason for the open move had to do with scale: As markets grow larger and more complex, the incentives for simpli-

porate interests? Can it be reversed? For instance, do the recording companies have any chance at all of persuading music lovers to abandon their MP3 files for a more proprietary digital audio format? Can standards exist over the long term as proprietary intellectual property?

In the mid-1990s, Don Potter, now the president and CEO of Windermere Associates, a consultancy in Moraga, Calif., developed an interesting insight into those questions. Potter argued that markets come in two ages or phases: When technologies are new, vendors in that market differentiate and customers buy on functionality and cost. As markets mature, according to Potter's sequence, customers become more concerned with simplifying their relationship with the technology. They start picking

Dilemma: When New Technologies Cause Great Firms to Fail (Harvard Business School Publishing, 1997).

If Potter is right, the drive toward openness should influence development in all IT sectors once they reach a certain age and size. The interest in open systems in the early '90s signaled that the IT industry was old and large enough to begin moving up the sequence. At that time, the desired convenience was the freedom to mix hardware and software from different vendors. During the next several years the issue of the moment sometimes changed (freedom from bugs, ease of modification) but almost always the term *open* has implied a jump to a higher level of reliability and convenience.

Eventually user convenience might collide with business models based on intellectual property. For instance, while standards can exist as private property (Windows is a standard), once a market finds its buyers, future revenues come from upgrades. That could become a problem, as upgrades—increasingly referred to derisively as downgrades—often take a toll on reliability and convenience.

It is easy to imagine that vendors would do well to sell convenience directly, in the form of customization, support, management and training services. That objective would be better served by opening up their programs, perhaps releasing them under one of the several open-source licenses, since it would make the market for those services as large as possible.

The final lesson of Potter's sequence, which of course could be wrong, is that the demand for user convenience will eventually dominate all markets of any size and age. Any vendor that tries to stand against this demand will end up wishing that it had not. The recording companies have gallantly stepped forward to test this proposition in public. We thank them and eagerly await the outcome. **CIO**

Do you have a topic you'd like to see us revisit? Send it to et@cio.com.

Getting to openness turned out to be not a single step but a lifelong process.

fying access between buyers and sellers grow as well. As information networks incorporate more players and devices, interoperability issues become more critical. During the '90s, both those trends helped make standardization issues a routine part of the IT manager's job. (While the term *open* is not synonymous with *standards* there is considerable overlap. Open usually refers to the large fraction of standards that are either not the property of a single company or have been made freely available by their owners.)

Often these issues included thinking about standardization itself. How ambitious is the process? Does it have an "embrace and extend" agenda that is as far-reaching as Microsoft's? If so, can IT resist the process if it begins to work against cor-

the product that promises to make their life easiest. Depending on the exact context, that means improving reliability and combining ease of use, ease of purchase, and ease of personalization or customization.

"You often read that commodity markets are markets where people buy on price," Potter says. "Actually in those markets, prices tend to be about the same. What usually controls buyer choice in so-called commodity markets is some mix of reliability and convenience."

Part of what drives markets up Potter's sequence is experience. Over time, buyers develop a working consensus on what features a device needs, while sellers gradually figure out the best way of fabricating or manufacturing a device with those features. As those clarifications take hold, functionality and cost converge, leaving convenience and reliability as the "prevailing basis of competition," which is a phrase from Clayton Christensen, a professor at the Harvard Business School, who analyzed and extended Potter's ideas in *The Innovator's*

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Interview

BY SUSANNAH PATTON

LES Seagraves

Earthlink named Les Seagraves, a lawyer by training, its first chief privacy officer in December, charging him with overseeing all privacy matters in the company and responding to its customers privacy concerns. Last year the FBI served Earthlink—the nation's number-two ISP—with a court order to install the e-mail surveillance tool Carnivore on its network. Earthlink sued—and lost—but the case sparked a public outcry from privacy advocates. The Internet wiretap technology is designed to sit on an ISP's e-mail server and filter incoming and outgoing mail in search of addresses that are the target of an investigation. Earthlink eventually came to an agreement with the FBI in which the ISP can avoid using Carnivore, but the debate rages on.

CIO: What were Earthlink's original concerns with Carnivore?

Seagraves: Our first concern was that we didn't know exactly what Carnivore did. We were approached to put this on our system, but we couldn't look at it beforehand. We had no idea about the risks

involved. The second concern was from a legal standpoint. We felt that the trap-and-trace order it came under was old and applied to regular telephone conversations but maybe not to e-mail. The main thing was that we control our network, and this wasn't under our control.

What happened when you tried to install Carnivore at Earthlink?

In order to test the system, we put it on a mail server, which brought it to a halt. We began to challenge Carnivore legally. Now if we get a similar court order for information, we have an agreement with the FBI that they will give us the target addresses and we will figure out a way to get only those messages. In that way, we have total control over it, and we can get what the law requires and still protect our other customers' privacy as much as possible.

Are companies trying to gather information without infringing on people's rights?

I'm sure that most companies with the technical resources are doing so. My concern is that smaller companies and ISPs that may not have either the time or the capability to do it would be pressured to install Carnivore without knowing what it is or how it works. No one really knows how it works. The FBI hasn't let anyone really look at it.

Why haven't CIOs been more vocal?

They have to balance customer privacy and legal compliance with criminal investigations. Many companies are dealing with it, but it's not something they want to make a lot of noise about. Companies are waiting to see how the Bush administration will deal with this question. **CIO**

Send your thoughts to Senior Writer Susannah Patton at spatton@cio.com.

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